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No. ____

IN THE
Supreme Court of the United States
OCTOBER TERM, 1996

HONEYWELL, INC.,
Petitioner,

v.

LITTON SYSTEMS, INC.,
Respondent.

Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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PETITION FOR A WRIT OF CERTIORARI

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QUESTIONS PRESENTED

1. Whether patent infringement may be found under a "substantial differences" doctrine of equivalents that applies even where (a) the patent nowhere discloses the equivalence of the defendant's process; (b) the alleged equivalence was not known at the time of the patent; (c) the defendant's process operates in a different way from the patented process; and (d) the equivalence ruling extends the patent's coverage beyond a specific limit that was demanded by the Patent and Trademark Office and accepted by the patentee.

2. Whether liability for infringement under the doctrine of equivalents may be imposed where the jury adopted a legally erroneous construction of the patent claims and the appellate court deferred to the jury's equivalents finding under a substantial evidence standard.

3. Whether an appellate court may affirm a general jury verdict that likely rested on a legally defective ground, as long as the verdict "could have" rested on another ground.

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PETITION FOR A WRIT OF CERTIORARI

Petitioner Honeywell petitions for a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit in this case, involving questions about patent infringement under the doctrine of equivalents and appellate review of general verdicts that may have rested on legal error.[1]

OPINIONS BELOW

The opinion of the court of appeals (App., *infra*, 1a-47a) is reported at 87 F.3d 1559. The opinion of the district court on post-trial motions (App., *infra*, 48a-158a) is not reported.

JURISDICTION

The judgment of the court of appeals was entered on July 3, 1996. App., *infra*, 1a. A timely petition for rehearing was denied on September 11, 1996. *Id.* at 163a-64a.

STATEMENT

A. Background

1. Commercial as well as military aircraft use gyroscopes as parts of complex, integrated navigation systems. In the 1970s, those systems began to incorporate a new type of gyroscope, a "ring laser gyroscope," which includes among its many elements certain highly refined mirrors for reflecting lasers around a ring. The mirrors are formed by depositing multiple layers of various materials to form a thin optical film on a background, or substrate.

One method of making the films, the "electron beam" method, uses an electron beam to bombard targets made up of the desired materials, heating up the targets and causing some of the material to evaporate and deposit it-

[1] Pursuant to Rule 29.6 of this Court's Rules, Honeywell states that it has no parent company and no domestic nonwholly owned subsidiaries with publicly issued shares. A list of nonwholly owned subsidiaries is included as Appendix E, *infra*.

self on the substrate. *See* App., *infra*, 53a-54a. An alternative set of methods for "sputtering" to create the mirrors uses ion beams, rather than electron beams, to bombard the chosen targets so as to dislodge material for building up layered deposits on a substrate. *Id.* at 55a. Ion beams can be generated from various sources, as was already well known in this crowded field by 1978, but the differences were such that few of the sources were then known to be usable for present purposes. *See id.* at 56a-60a, 134a n.43; *Patent File* 173-83.[2] This case involves a dispute about different sources for the formation of ion beams to be used in the mirror-production process.

2. In April 1978, Litton—as assignee of inventors David Wei and Anthony Louderback—filed a patent application for a method of making multilayer optical films. App., *infra*, 60a. Litton submitted no articles or earlier patents showing the state of prior learning relevant to the

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[2] Trial Exhibit Number 5594 consists of the entire file from the Patent and Trademark Office (PTO) for the patent at issue—the 1989 "reissue" patent. This exhibit, obtained from the PTO pursuant to 37 C.F.R. § 1.11(a) and consecutively paginated when introduced into evidence, is hereafter cited as "*Patent File.*" Three copies have been lodged with the Clerk.

Pages 171-204 of the *Patent File* consist of a chapter by James Harper, entitled "Ion Beam Deposition," from a 1978 book entitled *Thin Film Processes*; Litton submitted the chapter to the PTO as its primary authority on the contemporaneous state of knowledge about ion-beam processes for creating thin films on substrates. *See* page 6, *infra*. Within that chapter, pages 174-81 separately identify a number of *different* types of sources for the production of ion beams—including a "Kaufman ion source," which uses a "thermionic" (*i.e.*, hot-wire) cathode; a duoplasmatron; and a hollow cathode ion source. *See* App., *infra*, 134a n.43. "Radio frequency" sources for producing ion beams, also different from the Kaufman-type source, were similarly well known, "dat[ing] from the 1960s." *Id.* at 136a & n.45; *see* Tr. 6228-32, 6237, 6921, 6947, 7856-61; *Patent File* 41, 117 (paper #73, dated 1975). The 1978 Harper chapter notes that only the hot-wire Kaufman source and the duoplasmatron were then in practical use for the purposes relevant to this case, noting that the other known ion-beam sources "may" prove useful in the future. *Patent File* 174; *see id.* at 180.

claimed invention, but the PTO examiner discovered such prior art and rejected the application's claims as obvious. *Id.* at 61a. After Litton submitted a narrowing amendment, the examiner dropped his objection, and on March 6, 1979, Litton obtained U.S. Patent No. 4,142,958 (the '958 patent). *See id.* at 62a; *Patent File* 31-35.

Under 35 U.S.C. § 112 (paragraphs 1 and 2), a patent must include a detailed "specification" describing the invention so as to enable the skilled public to make and use it, then must separately state "claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." The key "claim" in Litton's 1979 patent broadly covered the making of mirrors by use of "an ion beam" to bombard multiple targets (under certain well-known conditions, such as use of a vacuum chamber for the whole bombarding-depositing process). *Id.* at 35; *see* App., *infra*, 61a. The patent's detailed specification of how to make and use the invention described only one ion-beam source among those known at the time, "a commercially available ion emitting apparatus generally known in the art as a Kauffman type ion beam gun," which uses "a thermionic emitter, i.e., it emits electrons by passing an electric current through it which heats the wire." *Patent File* 33; *see id.* at 31 (drawing); note 2, *supra* (detailing other types of sources for ion beams, varying in usability, then known in the art). But the *claim* was not limited to this particular source for the production of an ion beam.

This patent was invalid: what Litton asserted as nonobvious was in fact well known in the prior art. App., *infra*, 62a. Litton never sought to enforce this patent. *Id.* at 65a. Litton did not invoke any rights under it even after Honeywell, relying on the invalidity of the '958 patent, began in 1985 to incorporate in its ring-laser gyroscopes a form of mirror created using "an ion beam"—though the source for the ion beam was different from the Kaufman gun identified in Litton's patent. Honeywell obtained some of its mirrors from one of Litton's original

inventors, Louderback, after he had left Litton and formed his own company. *Id.*

3. Rather than enforce its invalid '958 patent, Litton applied to the PTO in mid-1985 for a narrower "reissue" patent under 35 U.S.C. § 251, which requires, as a precondition, a "surrender" of the original patent. *Id.* Litton, in seeking the reissue patent, stated expressly that its original patent was "invalid," in that it "claimed more than [it] had a right to claim." *Patent File* 151, 152; *see* App., *infra*, 66a. Eventually, a reissue patent was granted, but only on the condition that it be limited to an ion beam from a particular source, the Kaufman-type ion-beam source. *Id.* at 160a (district court finding that PTO rejected the claim as long as it "lacked the Kaufman-source limitation" and "specifically made overcoming its rejection . . . dependent upon the addition of the limitation" because "without the limitation, Litton was not 'claiming what they regarded as their invention' "), readopted at *id.* at 137a-38a.

In Litton's initial reissue application, Litton narrowed its '958 claim only by adding a requirement that the several layers of materials built up to form the mirror should refract light differently. *Patent File* 13; App., *infra*, 66a. This time, unlike when it applied for its original '958 patent, Litton submitted a large volume (notably, though, not all) of the relevant prior art: initially, Litton identified 22 patents and other prior-art sources (*Patent File* 18); two months later, Litton expanded the list to identify 82 items (*id.* at 37-51). App., *infra*, 66a-67a. A few months afterward, another party brought to the PTO's attention some additional, centrally important prior art that Litton had omitted from its submissions. *Patent File* 52-67; App., *infra*, 66a-67a. The PTO, for the first time reviewing the extensive literature, now concluded that it had been wrong when, in 1979, it had found Litton's claim to be nonobvious (*Patent File* 75), and it rejected the application for reissue for that reason and a host of others. *See id.* at 70-76; App., *infra*, 62a n.8, 68a.

Litton responded with a declaration arguing the patent ability of what it claimed. *Patent File* 78-87. It attached a declaration of the original co-inventor, Louderback, who defended the Litton method's patentability over prior art on the ground that *its* ion beam came from a "Kauffman type ion beam gun" rather than the "duoplasmatron gun" that was used in the key prior patent in the area, the 1975 Bernard patent, which also involved ion-beam sputtering to produce multilayer thin-film coatings. *Patent File* 89. Louderback stated that, as of 1978, "*any* other method" than the "Kauffman gun ion beam deposition methods disclosed in the '958 patent" was not usable to make sufficiently refined mirrors. *Id.* (emphasis added); *see* note 2, *supra* (other ion-beam sources). At the same time, Litton stated, as its primary argument on the remaining dispute with the PTO, "What is novel and unobvious about Applicants' invention is the use of ion-beam sputtering techniques, *and particularly the use of Kaufman gun ion beam techniques*, to form multiple-layer optical films . . . ." *Patent File* 99 (emphasis added).

The PTO examiner responded by finally rejecting the application, again citing obviousness and several other grounds. *Patent File* 104-110; *see* App., *infra*, 70a-72a. In particular, the examiner stated: "As for applicants' arguments based upon an alleged unexpected result obtained by use of a Kauffmann type ion gun rather than a duoplasmatron type ion gun, it is noted that most of the claims are not limited to any particular type of ion gun; thus applicants are arguing a limitation not in the claims." *Patent File* 109. The examiner added that the "Kauffman type ion sources" were standard in ion-beam sputtering and, moreover, had not been proved to produce any unexpected result. *Id.*; *see* App., *infra*, 72a.

Litton tried again a few months later, submitting certain amendments (none relevant here), as well as its own declaration and declarations of several individuals (with various attachments), collectively designed to cure some of the defects in the reissue application and to persuade

the examiner that patentability standards had been met. *Patent File* 112-204. Litton stressed that it had been the first "to utilize Kaufman-type ion beam sources for making multiple layer optical films" (*id.* at 129) and that its "claims relate only to Kaufman-type ion-beam sputtering" (*id.* at 130). In answer to the examiner's objection that Litton's claim, still referring to "an ion beam" without limitation as to the source of the ion beam, covered more than the Kaufman-type source it had proved to work, Litton responded that the claim should not (and would not) be so read, because such a broad reading "would make the claimed method *unworkable.* For this reason, Applicants need not add the words 'Kaufman gun' or 'Kaufman source' to claim 1 because claim 1 *cannot properly be construed to refer to any other ion beam gun but the Kaufman gun.*" *Id.* at 131 (emphasis added). Litton thus isolated the Kaufman source against the backdrop of its reliance (*id.* at 127-30), through a new declaration by Baumeister (*id.* at 143-50), on the clear record of knowledge, in 1978, of a number of different ion-beam sources, including not just Kaufman-type (hot-wire cathode) sources and duoplasmatrons, but hollow-cathode, radio-frequency, and other sources as well. *See generally* note 2, *supra*; App., *infra*, 72a-74a.[3]

The examiner, now convinced that all but one objection had been overcome, responded in an interview with Litton: "allowance of the application was possible if all the claims were limited to Kaufmann ion sources being used in the claimed process. Unless the claims were so limited, the Examiner indicated that a 35 U.S.C. 112 Par.

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[3] Baumeister not only attached and placed primary reliance on the 1978 chapter discussed in note 2, *supra*, but also attached and relied on a 1982 review article (*Patent File* 148, 164-68) that, in turn, cites the 1978 chapter as providing an "excellent review of the fundamentals of ion beam deposition." *Id.* at 166.

2 rejection [would issue] on the basis that applicants were not claiming what they regarded as their invention . . . ." *Patent File* 205; *see* App., *infra*, 74a-75a.[4] To give itself time to consider the examiner's sole remaining condition for issuance, Litton filed with the PTO a protective appeal from the examiner's earlier rejection. *Patent File* 206. After two months, Litton decided to "acquiesce[] in the examiner's position." App., *infra*, 75a. The examiner recorded that, in an interview, Litton "agreed . . . to incorporate a Kaufman ion gun limitation in claim 1." *Patent File* 208.

Litton subsequently submitted an amendment to restrict the basic claim 1 from "an ion beam" to the more limited "an ion beam produced by or derived from a Kaufman-type ion beam source." *Id.* at 220. Litton explained that this language was "taken directly from the specification of the '958 patent" and that it had originally omitted this limitation because it had "thought that claim 1, read in light of the specification, implicitly limited claim 1 to a Kaufman beam source (commonly referred to as an ion beam gun)." *Id.* at 222-23. Litton stated that "[t]he addition to claim 1 of an explicit reference to the Kaufman-type ion beam source is made in response to the Examiner's requirement for this explicit limitation under 35 USC § 112, second paragraph." *Id.* The same limitation to the particular identified source of ion beams was then added, for the same stated reason, to claim 13. *Id.* at 224, 239-40.

Upon formal surrender of the original patent (*id.* at 237), the examiner considered all rejections overcome and closed the prosecution on the merits in June 1987. *Id.* at 241. The reissue patent, however, did not immediately issue. Instead, the PTO undertook an 18-month investigation of Litton's representations and omissions in the PTO application process (*id.* at 241-392), cutting

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[4] The district court's quotation of this handwritten Examiner Interview Summary Record, citing *Patent File* 205, seems to misread "paper" to say "page 22." App., *infra*, 75a.

short the inquiry only when the PTO ceased such investigations into "inequitable conduct." App., *infra*, 76a; *see Patent File* 393. The patent was then allowed to issue. *Id.* at 393-98.

The reissue patent, dated January 31, 1989, is U.S. Reissue Patent No. 32,849 (the '849 patent). It is by its terms limited to a process using "an ion beam produced by or derived from a Kaufman-type ion beam source." *Patent File* 403, 404 (independent claims 1 and 18 of the patent), quoted at App., *infra*, 5a, 76a. This is the patent at issue in this case.

B. District Court Proceedings

1. In 1990, Litton sued Honeywell for infringement of the reissue patent. *Id.* at 6a. Honeywell had since 1985 been using a mirror-making process that incorporated a "hollow cathode" source for ion beams; some of its mirrors made with that source were made by and purchased from Louderback, who had left Litton in 1981. *See id.* at 3a, 63a-65a, 130a; *see also* note 2, *supra*. Honeywell responded to the suit by undertaking more than a year of new research and development; by 1992, it had successfully designed and begun to use a new source for ion beams—the "radio frequency" source, which has no cathode at all to produce the ion beam, "offers significant functional advantages over the Kaufman-type ion-beam source," and produces a " 'cleaner' " beam, as Federal Circuit Judge Bryson later explained. *Id.* at 36a.

Litton alleged that both of Honeywell's ion-beam processes, the hollow-cathode and radio-frequency, infringed Litton's reissue patent. It alleged that both sources infringed the patent literally and under the "doctrine of equivalents." *Id.* at 19a, 123a. Litton further claimed that Honeywell had committed the torts of intentional interference with a Litton license agreement with Louderback and with Litton's prospective economic advantage. *Id.* at 3a, 6a, 46a, 138a, 143a.

2. The jury found for Litton, and awarded damages of $1.2 billion, on each of those claims. *Id.* at 6a-7a; *see, e.g.*, Special Verdict Form, Aug. 31, 1993 (questions 5, 6, 17, 18, 21) ["Verdict"]. The jury, assigned the task of claim construction over Honeywell's objection, adopted Litton's construction of the relevant patent claims as covering "[a]ny broad-beam, multiapertured, gridded ion beam source, which includes any hollow cathode gun and any radio frequency gun," not just Litton's specified hot-wire cathode "Kaufman-type" source. Verdict (question 1); *see* App., *infra,* 130a. The jury next found that each of Honeywell's two ion-beam processes infringed Litton's patent claims, both literally and under the doctrine of equivalents. Verdict (questions 5, 6); *see* App., *infra,* 7a, 123a. Having found infringement, the jury rejected Honeywell's argument that Litton's reissue patent was invalid on grounds, among others, of obviousness. *See* App., *infra,* 6a, 51a; Verdict (question 11).

The jury also found for Litton on its state tort claims. In particular, it found that Honeywell had intentionally induced a breach of the Litton-Louderback license agreement through "wrongful means" (*id.* (questions 18, 19)) and interfered with Litton's prospective business through "wrongful means" (*id.* (questions 21, 22)). The jury did not identify whether it was relying on its finding of patent infringement, or on some other basis, in finding a breach of the license agreement or wrongful means. *Id.*; *see* App., *infra,* 22a-29a, 138a-46a. The jury awarded the same damages on the patent and tort claims. *Id.* at 6a-7a.

3. The district court, in what Judge Bryson described as "a careful and comprehensive 113-page opinion" (App., *infra,* 34a), overturned the jury's verdict and entered judgment for Honeywell. *Id.* at 51a-158a. To begin with, the court held Litton's reissue patent invalid. The court rested that conclusion on the grounds that the claimed invention was obvious in the light of the highly developed state of the prior art (*id.* at 78a-98a) and, independently (based on its post-trial hearing), that Litton had pro-

cured the reissue patent by inequitable conduct, *i.e.*, through material misrepresentations and nondisclosures in the PTO (*id.* at 99a-123a).

The court then turned to the infringement issue, assuming that the patent was valid. The court concluded first that the construction of the patent claims adopted by the jury was incorrect, because the claims, properly construed, are limited to the identified hot-wire-cathode, "Kaufman type," ion-beam source. *Id.* at 123a-29a. The court observed, in particular, that the patent file contained references to "a number of other broad beam ion sources" in addition to the Kaufman-type source and the duoplasmatron (*id.* at 127a-28a; *see id.* at 134a n.43; note 2, *supra*), but Litton had limited its patent claims to the Kaufman-type source, at the PTO's insistence, precisely because "neither [Litton's expert Baumeister] nor Litton knew *what results* could be achieved by the use of any ion beam sources other than duoplasmatrons and the Kaufman-type ion beam gun in the specification." *Id.* at 128a. Lacking any " 'comparative data' " on other sources, which would have been demanded by the PTO if the claims had been broader, Litton could not have claimed, and did not claim, any source except the hot-wire Kaufman-type source. *Id.* Based on this construction, the district court readily ruled out literal infringement, because the claims did not cover either Honeywell's hollow-cathode source or its radio-frequency source. *Id.* at 129a-30a.

With Honeywell's processes outside Litton's patent claims, the court next considered whether they nonetheless were infringing as "equivalents" of the claims. The court relied on the Federal Circuit's allowance of "equivalents" not known to be substitutes at the time of the patent. *Id.* at 131a. The court also relied on the Federal Circuit's constricted view of "prosecution history estoppel" as a bar on obtaining "equivalents" to expand patent scope beyond those claim limits specifically demanded by the PTO and accepted by the patentee (rather than challenged through internal PTO appeals) in the application process. The Federal Circuit has made this

limitation on equivalents infringement turn on a judicial evaluation of the reason for the PTO's demand—particularly, whether it was to avoid prior art (35 U.S.C. §§ 102, 103) or instead was to comply with some other statutory requirement of patentability (*e.g.*, 35 U.S.C. § 112). *Id.* at 132a-33a.

The district court could reach no conclusion about prosecution history estoppel under the Federal Circuit's standards. *Id.* at 134a-35a. It concluded, however, that Honeywell's hollow-cathode source, though an "improvement of the Kaufman-type ion beam gun in the specification," was "within the narrowest range of equivalents which must be accorded the '849 reissue." *Id.* at 136a. On the other hand, the court concluded that the radio-frequency source was not an equivalent. *Id.* at 136a-37a. The court explained that this source "[c]learly . . . does not produce ions in the same way as the 'Kaufman-type ion beam source' "—it has no cathode at all—and pointed to the evidence of the "much improved and less contaminated result" of the radio-frequency source. *Id.* at 137a.[5]

The court then held that Litton had not proved its state-law tort claims. It explained that Litton simply had not proved that Honeywell had induced breach of Litton's license agreement with Louderback (*id.* at 138a-43a) or, given the absence of a valid patent, had otherwise used "wrongful means" to obtain its ion-beam technology or to compete with Litton for prospective customers (*id.* at 143a-46a). Finally, in the alternative, the district

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[5] In its final patent-law ruling, the district court held that Honeywell had "intervening rights" under the reissue provisions of the patent law (35 U.S.C. §§ 251, 252) as to any conduct prior to the reissue patent, because the reissue patent was narrower than the surrendered '958 patent. App., *infra*, 137a-38a (readopting the pretrial findings and conclusions on this issue, set forth at *id.* at 159a-62a). The result of that ruling, which the Federal Circuit subsequently affirmed (*id.* at 33a), is that there was no patent limitation on Honeywell prior to the reissue patent in 1989—which was predicated on Litton's surrender of the invalid '958 patent. *Id.* at 42a (Bryson, J., concurring in part and dissenting in part).

court granted a new trial as to damages on all claims, concluding that the overwhelming weight of the evidence was that the challenged acts of Honeywell, even if wrongful, were not the but-for cause of Litton's failure to get the business on which it based its damages claim. *Id.* at 147a-57a.

C. Court of Appeals Decision

On appeal, a divided panel of the Federal Circuit reinstated the jury's verdicts of liability for infringement of the reissue patent and for the state-law torts, while affirming the district court's grant of a new trial on damages. *Id.* at 1a-47a. In partial dissent, Judge Bryson characterized this as "a classic case of unduly broad extension of the doctrine of equivalents" that serves "to fuel the case against the doctrine." *Id.* at 40a.

1. The court initially held that Litton's reissue patent was valid, concluding that "substantial evidence" supported the jury's finding of nonobviousness (*id.* at 16a) and that there was no showing of misrepresentations or omissions that would justify invalidation on grounds of inequitable conduct (*id.* at 16a-19a). Judge Bryson concurred in these rulings, though with reservations, citing binding Federal Circuit precedent on the narrow scope of review. *Id.* at 34a. He stated that the obviousness issue is "close and difficult" even under such narrow review and that "the issue of inequitable conduct is also close and reveals a pattern of disturbing conduct by Litton both in the prosecution of the initial patent and in the reissue proceedings." *Id.*

2. On the issue of infringement, the majority accepted the district court's rejection of the jury's express misconstruction of the patent claim and the district court's rejection of literal infringement, but it reinstated the jury verdict for patent infringement based on the doctrine of equivalents. *Id.* at 19a-21a. In applying the doctrine of equivalents, the majority quoted and relied on its own

recent summary of the controlling *en banc* decision in *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512 (Fed. Cir. 1995), *cert. granted*, 116 S. Ct. 1014 (1996), stating that it would look beyond the "function-way-result test (FWR) of *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605 (1950)" to examine "the substantiality of changes from the claims in the accused device." *Id.* at 19a-20a (internal quotation marks omitted). The majority in four short paragraphs then found "substantial evidence" to support the finding by the jury (which had misconstrued the claims) that Honeywell's ion-beam sources were "equivalents" of Litton's claims. *Id.* at 20a-21a.

The majority reached that conclusion as to Honeywell's hollow-cathode and radio-frequency sources even though neither is anywhere disclosed by Litton's patent as an equivalent. The majority stated that both were known to be interchangeable with the Kaufman-type source, *not* when the patent issued, but "at the time of infringement." *Id.* at 21a. The majority also concluded that the radio-frequency source was an equivalent despite the fact that it does "not produce ions in the same way as the Kaufman-type ion-beam source," stating that the "beam" it produced was "substantially similar, if not identical, to the Kaufman-type ion beam." *Id.*

In addition, the court summarily concluded that prosecution history estoppel did not disable Litton from asserting equivalents of its Kaufman-type ion-beam source. The court did not question the plain facts laid out by the district court: Litton had accepted, rather than challenged through the available PTO processes, the PTO examiner's specific demand to limit the patent claims to the Kaufman source from the range of sources then known to be available (though most were not then known to be interchangeable). Rather, it concluded in one sentence that the Kaufman source limitation was included merely to distinguish "a duoplasmatron," the only source that Litton specifically discussed in distinguishing the key prior pa-

tent. App., *infra*, at 20a. In thus restricting its focus to the one "prior art" source, the court relied on its earlier precedents (as elaborated by the district court, *see* pages 10-11, *supra*) holding that it must reexamine and distinguish among the *reasons* for a PTO demand, and need not respect the PTO-demanded, patentee-accepted limit if the reason for the limit was a patentability requirement other than "prior art." [6]

Judge Bryson concurred as to equivalents-based infringement for Honeywell's hollow-cathode ion-beam source, but he did so citing "the restrictive standard of review applicable to a jury's verdict on . . . infringement" and stating that the "jury's verdicts finding infringement with respect to *both* technologies before it are difficult to accept." *Id.* at 34a (emphasis added). Judge Bryson dissented, however, as to the finding of infringement for Honeywell's current technology, the radio-frequency ion source, explaining that it is "different structurally" from and "offers significant advantages over" the Kaufman-type source identified by Litton's claims. *Id.* at 36a. "The [radio frequency] source generates the ion beam in a way that is quite different from the Kaufman-type source, and the [radio frequency] source produces significantly improved results as compared to the Kaufman-type source." *Id.* at 37a-38a. Judge Bryson explained that it could not be enough that the different ion-beam sources served the same function of producing ion beams, because "the fact that two features serve the same function is only the beginning of the test for legal equivalence." *Id.* at 37a.

Judge Bryson elaborated on the adverse effects and unfairness of the majority's broad ruling on equivalents in-

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[6] In overturning the district court's entry of judgment for Honeywell, the court of appeals did not mention, let alone say anything to revive, the jury's separate finding that the infringement had been willful. *See* App., *infra*, 7a, 19a-21a, 34a. Litton, in seeking reversal of the district court's judgment of noninfringement (Litton Br. 30-37), presented no argument seeking revival of the willfulness finding.

fringement. As Judge Bryson explained, one adverse consequence is that it allowed Litton to use the infringement action to erase a limit that it had accepted, rather than challenged through PTO appeal processes, as a condition of obtaining the patent—the issue addressed by the "prosecution history estoppel" limit on infringement by equivalents (*id.* at 38a):

> What is most troubling about Litton's doctrine of equivalents argument with respect to the [radio frequency] process is that the limitation of the claims in the reissue patent to Kaufman-type ion-beam sources makes it quite evident that the property rights that the PTO believed should be accorded to Litton were limited to a particular kind of ion-generating system. In reissuance, Litton gave up its original claims, in which it broadly claimed a method based on any "ion beam source." But it has now managed, in effect, to regain the ceded ground through the doctrine of equivalents. Under these circumstances, for the court to hold that Litton is entitled to recover for Honeywell's use of technology that falls well outside the limits of the property rights granted to Litton seems to me improper.

Judge Bryson, who had not participated in the *en banc* decision in *Hilton Davis*, then explained the more general problems caused by the doctrine of equivalents. "Because the doctrine of equivalents adds considerable uncertainty to the question of patent infringement, it introduces a large component of unpredictability into an area of commercial law in which predictability is critical," as this Court explained last Term in *Markman v. Westview Instruments, Inc.*, 116 S. Ct. 1384 (1996). App., *infra*, 38a-39a. Judge Bryson noted that "[i]nfringement claims now routinely come with two components—literal infringement and infringement by equivalents—and the latter is often more significant in counseling and litigation than the former." *Id.* at 39a. He then explained (*id.*):

> Patent counselors should be able to advise their clients, with some confidence, whether to proceed with a product or process of a particular kind. The

> consequences of advice that turns out to be incorrect can be devastating, and the costs of uncertainty—unjustified caution or the devotion of vast resources to the sterile enterprise of litigation—can be similarly destructive. An expansive doctrine of equivalents can make counseling clients on infringement an exercise in hedging.

Judge Bryson concluded that this case dramatically illustrated these problems (*id.* at 40a):

> Can we reasonably expect a patent counselor to have confidently advised Honeywell that the RF ion-beam system would infringe Litton's patent? Four judges have now looked at that question; two have concluded that infringement by equivalents cannot reasonably be found, and the other two have concluded that a jury could permissibly find infringement. That diversity of views suggests that the infringement question cannot be answered with the level of confidence that the law ought to provide to lawyers and businessmen facing multi-million dollar decisions. The application of the doctrine of equivalents in a case such as this one thus seems to me to fuel the case against the doctrine, not to support its continued existence within the narrow limits where its purposes are most clearly served and its costs kept to a minimum.

3. On the state-law torts, the majority reinstated the jury's liability finding. *Id.* at 22a-29a. In so doing, the majority stated that it did "not premise its conclusion regarding the state law claims on the existence of a patent." *Id.* at 22a n.3. Having repeatedly relied on its own view of patent infringement to support the jury's findings of induced breach of contract and wrongful means in impairing Litton's future business (*e.g.*, *id.* at 3a, 28a), the court could not have denied, and did not deny, that the jury might similarly have relied on patent infringement for its state-law verdicts. Rather, the court postulated that the jury "could have" rested its state-law verdicts on a non-patent basis and, given that possibility, affirmance was required, because "[i]t is the duty of the appellate court to

sustain a jury verdict under any reasonable theory." *Id.* at 22a n.3. Judge Bryson dissented as to the affirmance of the state-law verdicts, explaining in particular that Litton had failed to prove a nonpatent basis for its state-law claims. *Id.* at 40a-47a.

4. The court of appeals denied rehearing. *Id.* at 16[illegible]-64a. (The court, as well as the Chief Justice, subsequently denied requests for a stay.) Having rendered a final determination of patent infringement under the *Hilton Davis* standards, as well as state-law liability, the court remanded the case. In addition to the required retrial on damages, Litton has moved the district court for an injunction (*see* 35 U.S.C. § 283) to stop Honeywell from, among other things, continuing to use the radio-frequency ion-beam source (the only one it has been using since 1992) for the making of gyroscope mirrors for aircraft navigation systems.

REASONS FOR GRANTING THE PETITION

The primary issue raised by this case—the scope of any doctrine of equivalents allowing expansion of patent scope beyond the meaning of claim language—is currently before this Court in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, No. 95-728 (oral argument held Oct. 15, 1996). The present petition should, at the least, be held pending the Court's decision in *Warner-Jenkinson* and then acted on, as appropriate, in light of that decision. Any material narrowing of the doctrine of equivalents there would require reconsideration of the infringement ruling here. Indeed, as Judge Bryson explained (App., *infra*, 38a-40a), this case dramatically illustrates and bolsters the need to rein in the uncabined, unpredictable standards for "equivalents" that, once narrow and exceptional, have become the general rule available as a routine second cause of action in every infringement case: those standards now undermine the fundamental statutory policy that it is in the PTO (with appeal mechanisms if needed) that a patentee is supposed to negotiate and settle on the definition of its protected invention, so that what emerges

from the process is a patent whose boundaries may be reliably known by other inventors and competitors based on what the patentee has clearly disclosed through its PTO-approved claims. *See* 35 U.S.C. § 112. Competition and future innovation depend on such reliable boundaries.

This case, moreover, presents at least four aspects of the Federal Circuit's ever-less predictable and disciplined doctrine of equivalents that would warrant plenary review and correction in the event that *Warner-Jenkinson* leaves them unaddressed. First, patent scope was expanded under the doctrine to "equivalents" nowhere disclosed in the patent. Second, the expansion embraced "equivalents" not known as such *at the time of the patent*—hence not capable of discernment, without independent experimentation and research, from an intelligent reading of the patent documents. Third, the expansion included a process that concededly operated in a different "way" from the patented process, thus undermining even the constraints of the function-way-result formulation of *Graver Tank*. Finally, based on the Federal Circuit's narrowing of prosecution history estoppel as a critical constraint on the doctrine of equivalents, the grant of "equivalents" here allowed Litton to erase a limit on coverage that was specifically demanded by the PTO as a condition of issuing the patent and then accepted by Litton (rather than challenged through the statutorily designated pre-issue mechanism). This Court should correct each of these steps in the Federal Circuit's expansion of the doctrine of equivalents to the point that, as Judge Bryson showed, it deeply undermines core statutory principles.

The Federal Circuit's upholding of the jury's "equivalents" finding is infected with a second error. The court affirmed that finding under the most deferential of standards, "substantial evidence," even though the jury expressly adopted a construction of the patent claim that was legally erroneous. Infringement thus has been finally determined without *either* the jury *or* the court of appeals making an independent determination of "equivalents" using the legally correct benchmark for comparison. This stark error

should be corrected to ensure properly disciplined infringement findings and to give meaningful effect to the *Markman* holding that claim construction is a matter of law for the court.

The Federal Circuit also committed an error of federal law in affirming the state-law verdicts—an error that becomes critical to the result if the patent-infringement ruling is legally erroneous. In upholding the general state-law verdicts despite its own demonstration that those verdicts likely rested on patent-infringement findings, the Federal Circuit held that affirmance was required as long as the verdicts "could have" rested on a nonpatent basis, regardless of any error in the patent ruling. That ruling about appellate review of jury verdicts is erroneous and in conflict with other circuits' law. This error of the Federal Circuit should be corrected along with its doctrine-of-equivalents ruling.

I. THE COURT OF APPEALS IMPROPERLY FOUND PATENT INFRINGEMENT UNDER AN EXPANSIVE DOCTRINE OF EQUIVALENTS

1. The core problem with the Federal Circuit's broad doctrine of equivalents, available as a general rule rather than a narrow exception, is that it undermines the fundamental statutory principle limiting patent monopolies to what is clearly disclosed through the PTO-approved claims. *See* 35 U.S.C. § 112 ("claims" must "particularly" and "distinctly" allege what patent applicant "regards as his invention"), § 131 (after examination, patent issues for "the alleged new invention"), § 271 (infringement is unauthorized making, using, or selling of the "patented invention"). The key function of the modern "claiming" system, affirmed by this Court repeatedly and as recently as last Term in *Markman*, is to make sure that the extensive process of application, examination, negotiation, amendment, and review *before* the patent issues (35 U.S.C. §§ 131-134, 141-145) produces a patent whose "claims" set clear boundaries for the protected invention that may be reliably known by the public through an in-

formed *reading* of the patent documents.[7] Indeed, this Court specifically defined the protected "invention" in just these terms in *U.S. Industrial Chemicals, Inc. v. Carbide & Carbon Chemicals Corp.*, 315 U.S. 668, 676-78 (1942), holding that the "invention" under the patent statute is only what is disclosed in the patent and does not embrace undisclosed changes even if they were undisputedly (and even known by the patentee to be) insubstantial as a scientific matter. *See Markman*, 116 S. Ct. at 1394 n.13, 1395 (twice relying on this passage from *U.S. Ind. Chem.*).

The Federal Circuit's broad and murky doctrine of equivalents has debilitating effects on this system and, as Judge Bryson explained, deprives inventors and commercial enterprises of reliable means to determine precisely where they should not be investing because the areas are walled off by patent monopolies. In this case, the Federal Circuit majority upheld the infringement finding of the jury in four brief paragraphs (App., *infra*, 20a-21a) reflecting no more than an intuitive judgment call, first by the jury and then by the panel majority, about whether the differences between Litton's and Honeywell's ion-beam sources were "substantial." Such a standard for infringe-

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[7] " '[T]he limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public.' Otherwise, a 'zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field,' and '[t]he public [would] be deprived of rights supposed to belong to it, without being clearly told what it is that limits these rights.' " *Markman*, 116 S. Ct. at 1396 (citations to *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938), *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942), and *Merrill v. Yeomans*, 94 U.S. 568, 573 (1877), omitted).

In addition, see, *e.g.*, *Milcor Steel Co. v. George A. Fuller Co.*, 316 U.S. 143, 145-46 (1942) ("claims . . . afford the measure of the grant to the patentee"); *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 510 (1917) (same); *McClain v. Ortmayer*, 141 U.S. 419, 423-24 (1891) (same); *Keystone Bridge Co. v. Phoenix Iron Co.*, 95 U.S. (5 Otto) 274, 278-79 (1877).

ment relegates other inventors and competitors to guesswork about what they may and may not do, the result depending on the selection of particular judges or jurors. *See, e.g., id.* at 34a, 40a (as to one source, 4 judges split 2-2 on legal sufficiency; as to the other source, equivalents finding upheld only under deferential review, with dissent noting reservations). The Patent Act demands an infringement standard providing more comprehensible constraint on judicial discretion and predictable guidance to businesses.

The Federal Circuit strayed, not based on any conclusion that patentees have insufficient means of self-protection without equivalents expansion,[8] but based on a vast overreading of this Court's 1950 decision in *Graver Tank*. *See Hilton Davis*, 62 F.3d at 1518-20. It read *Graver* as if the Court was silently repudiating not only *U.S. Industrial Chemical*'s then-recent clarification that the protected "invention" is limited to what the patent discloses but also the long line of other precedents limiting patent scope to the definite disclosures in agency-approved claims. *See* note 7, *supra*. *Graver* is properly read, not as a sweeping and unexpressed reversal of all this prior law, but as allowing "equivalents" expansion at most within one exceptional circumstance, consistent with the statutory principle of disclosure through approved claims—where there *was*

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[8] Applicants are entitled to obtain flexibility and breadth of claim language within the PTO, consistent with the requirement for definite claims. PTO, *Manual of Patent Examining Procedure* § 2173. While an application is pending (on average, patents issue after 1½ years), an applicant may conduct further experiments and broaden its disclosure by filing a continuing application. 35 U.S.C. § 120. Even after issue, the patentee may file a new application within one year without the same person's patent being counted as "prior art." 35 U.S.C. § 102(b). Reissue is available, moreover, to correct undue narrowness of claims in specified circumstances. 35 U.S.C. § 251. These provisions embody the balance that *Congress* has struck among the various interests affected by patents—the "first" inventor, "second" and subsequent inventors, competitors, and the public—with the patentee given the responsibility, but also these tools, for reliably defining its own protected invention.

disclosure of the equivalent in another agency-approved claim that was invalid solely for overbreadth. *See* D. Chisum, *Patents* § 18.02[2], at 18-14 (1996). In fact, the leading patent-law commentator has observed that *Graver* involved a peculiar situation where PTO rules (now defunct) created an apparent impediment to the patentee's ability to protect itself in drafting claims. *Id.* at 18-15; *see also Hilton Davis*, 62 F.3d at 1575 n.28 (Nies, J., dissenting). In any event, even aside from the fact of impediments to proper claiming, *Garver* provides no sound basis for awarding wholly undisclosed "equivalents," for erasing PTO-demanded limits, or for transforming a narrow exception into a general rule fostering systemic uncertainty as to patent boundaries.

2. This case highlights four particular elements of the Federal Circuit's expansion of liability under the doctrine of equivalents. This Court's precedents, including *Graver*, support none of these elements. The importance of restoring the public's statutory entitlement to clear PTO-approved boundaries supports review of these specific issues if they are left unaddressed in *Warner-Jenkinson*.

First, and most basically, the "equivalents" here were nowhere claimed or disclosed in the patent. And the absence of any reference to any ion-beam source other than the "Kaufman-type ion-beam source" cannot be attributed to any technical impediment to claim drafting. In both respects, the case is thus unlike *Graver*. Allowing post-hoc expansion of the scope of the patent in these circumstances left others who were working in the area, like Honeywell, unable to determine the protected boundaries by reading the patent documents.

Second, the Federal Circuit rested its equivalence holding on the principle that the "equivalent" need be known as such only "at the time of infringement," not at the time of the patent. App., *infra*, 21a; *see Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1220 (Fed. Cir. 1995), *petition for cert. pending*, No. 95-1096 (filed Dec. 26, 1995). But this principle expanding available equiv-

alents to post-patent discoveries was a wholly unauthorized departure from this Court's precedents (undisturbed by *Graver*), which repeatedly articulated the rule that one *necessary* condition of any equivalents expansion of patent scope was that the equivalent be known as an equivalent at the time of the patent, not discovered to be equivalent later. *See Hilton Davis*, 62 F.3d at 1570-72 (Nies, J., dissenting) (quoting, *e.g.*, *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 13 (1946); *Gill v. Wells*, 89 U.S. (22 Wall.) 1, 28-30 (1874); *Gould v. Rees*, 82 U.S. (15 Wall.) 187, 193-95 (1872)); *see* D. Chisum, *Patents* § 18.04[3], at 18-117 to -125 (1996) (citing only lower court departure from this precedent). This rule implements the core patent policy that it is only the knowledge that the *patentee* has added to the world, through disclosure in the patent, that is part of the protection. Where, as here, the "equivalents" were understood to be different (*e.g.*, not workable for relevant purposes) at the time of the patent, the later discovery of how to use them as a substitute for the patented process is not part of what the *patentee* discovered or disclosed; it is the result of the innovative efforts of *others* that patent law encourages.

Third, the Federal Circuit in this case upheld "equivalents" expansion of the patent's scope beyond the claim language even where it expressly acknowledged that the accused process and the patented process do not operate in a similar "way." Thus, as to the radio-frequency source, the Federal Circuit accepted that this source "did not produce ions in the same way as the Kaufman-type ion-beam source" (App., *infra*, 21a), but then deemed it sufficient that the result produced, the "beam," is similar (*id.*). (The claim language expressly limits the ion beams to a particular *source*—as demanded by the PTO after Litton trumpeted this *source* limitation as critical. *See* pages 5-7, *supra.*) Based on its reading of *Hilton Davis*, the court thus expressly repudiated even the guidance and constraint provided by the requirement that "function" *and* "way" *and* "result" all be similar to produce an equivalence (*see*

Graver Tank, 339 U.S. at 608). The result is a further loosening of the standards for nonliteral infringement that now govern inventors and commercial enterprises trying to gauge where they may not trespass and an undercutting of patent law's essential *encouragement* of innovators' efforts to "design around," *i.e.*, to find different ways of performing the same function. *See State Industries, Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, 1235-36 (Fed. Cir. 1985) ("designing new and possibly better or cheaper functional equivalents is the stuff of which competition is made and is supposed to benefit the consumer"); *Hilton Davis*, 62 F.3d at 1520.

Fourth, critical to the Federal Circuit's expansive license to extend patent scope beyond claim language is its cramped view of prosecution history estoppel as a constraint on the doctrine of equivalents.[9] The Federal Circuit allowed Litton, through "equivalents," to erase its acceptance in the PTO of the examiner's demand to write language into its patent claim to limit it to the specific Kaufman-type source. This Court's precedents—wholly unaffected by *Graver*—have long prohibited such use of the doctrine of equivalents. *See, e.g., Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 136-37 (1942); *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 220-21 (1940); *Smith v. Magic City Kennel Club*, 282 U.S. 784, 789-90 (1931); *I.T.S. Rubber Co. v. Essex Rubber Co.*, 272 U.S. 429, 443-44 (1926); *Hubbell v. United States*, 179 U.S. 77, 82 (1900).

The Federal Circuit did not question the district court's careful construction of the critical claim language—the

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[9] Prosecution history estoppel is " 'a limitation to infringement under the doctrine of equivalents.' " *Hilton Davis*, 62 F.3d at 1525. *Accord, e.g., Texas Instruments Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1173 (Fed. Cir. 1993); *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 1571 (Fed. Cir. 1983) (estoppel issue does not even arise with literal infringement); R. Merges, *Patent Law and Policy* 690 (1992); H. Schwartz, *Patent Law and Practice* 83 (2d ed. 1995).

"Kaufman-type ion-beam source" as meaning the specific hot-wire-cathode source—or the documented fact of the PTO's demand for that language to limit the claim to one specific *source* among the many reflected in the record. Nevertheless, the court allowed Litton in this infringement action to expand its patent scope to cover a range of other sources as "equivalents," even though Litton accepted the examiner's unmistakable demand for inclusion of this specific limit. *See* App., *infra*, 20a. The court summarily reached this conclusion only because in earlier decisions it had sharply restricted the prosecution-history-estoppel principle in two ways: (i) demanding a " 'close examination . . . [by the infringement court] as to, not only what was surrendered, but also the reason for such a surrender' "; and (ii) making a distinction among "reasons," with the patentee held to limits demanded by the PTO to avoid prior art but (often) not held to limits demanded to satisfy another requirement for patentability, such as Section 112's requirement that claims conform to what is disclosed as working. *Hilton Davis*, 62 F.3d at 1525; *see* App., *infra*, 132a-33a; *Pall Corp.*, 66 F.3d at 1218-20; *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 72 F.3d 857, 864 (Fed. Cir. 1995), *petition for cert. pending*, No. 95-1546 (filed Mar. 26, 1996).

These two limits on the estoppel principle are incompatible with this Court's decisions, which declare that an infringement action is not the proper place for reexamining the reasons for the PTO's demand for a change in the claim, and which apply the estoppel principle without regard to whether the PTO's reason was even decipherable, let alone based on patentability requirements other than avoidance of prior art.[10] Moreover, unlike this

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[10] *See, e.g., Smith v. Magic City Kennel Club*, 282 U.S. at 789-90 (reasons irrelevant); *I.T.S. Rubber*, 272 U.S. at 443 (same); *Schriber-Schroth*, 311 U.S. at 220-21 (examiner rejected *narrower* claim—which *could* not be to avoid prior art—for reasons that were a "mystery"); *Hubbell*, 179 U.S. at 82 (one demand based on definiteness).

Court's straightforward rule that a limit demanded by the PTO, once accepted, becomes binding regardless of equivalents, the Federal Circuit's introduction of an ill-defined "reasons" inquiry into estoppel analysis adds damaging uncertainty to the determination of patent boundaries, as shown by the district court's inability to reach a conclusion on this issue here (App., *infra*, 134a-35a). At the same time, the "reasons" inquiry ignores the core rationale of the estoppel principle: *any* challenge to the PTO examiner's demand for a claim limit, no matter what the reason for the demand, can and should be made through the statutorily provided internal appeal process—before an expert body, with the examiner participating (rather than before a court, in a private infringement action, with no PTO presence)—so that disputes about legitimate patent scope are resolved *before* the patent issues for public reliance.[11] Finally, and in any event, even if the PTO's reasons for a demanded limit could be reexamined in the infringement action, there is simply no basis in the statute for granting privileged status to some reasons for PTO rejection of patent claims and discounting others. *See* 35 U.S.C. § 282 (Section 112 equal ground for invalidity as Sections 102-103).

The Federal Circuit's weakening of the estoppel principle licenses patentees to broaden their patents' scope beyond what the PTO approved in the claims as issued, even where the application process produced focused attention on a specific limit through a PTO demand and the patentee bypassed the legally prescribed mechanisms for contesting the demand. It is improper, as Judge Bryson explained (App., *infra*, 38a), to allow the regaining of ground thus ceded in the PTO. Such a result im-

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[11] The statute and regulations provide a specific mechanism for contesting a PTO examiner's demand for narrowing of the patent—initially through the PTO Board of Patent Appeals and Interferences (where the examiner participates), then in the courts. 35 U.S.C. §§ 134, 141-146; 37 C.F.R. §§ 1.191-1.198, 1.301-1.304; PTO, *Manual of Patent Examining Procedure* ch. 1200 (1996 ed.); *see also* 35 U.S.C. § 154(b)(2) & (3) (extension of patent term based on appeals).

properly transfers to the Judicial Branch the task of patent definition specifically assigned by Congress to the Executive Branch.

II. THE COURT OF APPEALS IMPROPERLY DEFERRED TO A DETERMINATION OF EQUIVALENTS BY A JURY THAT MISCONSTRUED THE CLAIMS

Aside from relying on an incorrect substantive legal standard for the doctrine of equivalents, the court of appeals' affirmance of (potentially enormous) patent-infringement liability shows the court's standards for equivalents infringement to be out of control in another way. Neither the jury nor the court of appeals made an independent determination of "equivalents" using a proper claim interpretation. Yet there is now a judgment of patent infringement under the doctrine of equivalents.

The jury in this case, assigned the task of construing the claims prior to *Markman*, expressly adopted a construction of the patent claims (Verdict (question 1)) that the district court, in a ruling not questioned by the court of appeals, held to be legally incorrect. The claims, as construed, are necessarily the benchmark for comparison in determining the "equivalence" of the accused process. Thus, as Judge Bryson noted, "the jury's finding in this case was infected by its broad construction of the scope of the claims." App., *infra*, 36a.[12] As a result, even under the *Hilton Davis* standards, the jury finding of "equivalents" here could not be upheld under deferential "substantial evidence" factual review. *See, e.g., Boyle v. United Technologies Corp.*, 487 U.S. 500, 513 (1988). But that is all the Federal Circuit did. App., *infra*, 20a-21a.

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[12] In the court of appeals, Litton speculated that the jury, having settled on its reading of the claims in the very first Special Verdict question and necessarily used that reading to find literal infringement (Verdict (question 5)), suddenly switched gears and adopted the rejected claim construction as the benchmark for purposes of assessing "equivalents" (Verdict (question 6)). This strained supposition as to how the jury went about its work illustrates the grasping at straws needed to defend the result.

This stark error should be corrected even if the Court does not narrow the substantive standards of the doctrine of equivalents. At a minimum, the doctrine cannot be left so undisciplined that infringement can be finally adjudicated without even an independent judgment using the properly construed claims as the basis for comparison. Otherwise, in a case like this one—and in all those situations where the judgment of "equivalents" is initially made using a claim construction later rejected as a matter of law—the task of claim construction would be returned *de facto* to the jury, in direct contravention of *Markman*.

III. THE COURT OF APPEALS IMPROPERLY HELD THAT A GENERAL VERDICT MUST BE AFFIRMED, DESPITE ITS LIKELY RELIANCE ON A LEGAL ERROR, AS LONG AS IT "COULD HAVE" RESTED ON ANOTHER BASIS

In reinstating the state-law tort liability verdicts, the Federal Circuit ruled that it was upholding the jury's general verdict on both state-law claims regardless of the legal dispute (reflected in Judge Bryson's dissent) about whether there was patent infringement—even though its own review of the evidence related to the state-law claims relied on patent infringement—because the jury "could have" relied on a nonpatent basis and "[i]t is the duty of the appellate court to sustain a jury verdict under any reasonable theory." App., *infra*, 22a n.3. That ruling is incorrect where, as here, one likely basis of the jury's verdict (patent infringement) was *legally* defective. It conflicts with the law of numerous other circuits and should be reversed. *See Virginia Bankshares, Inc. v. Sandberg*, 501 U.S. 1083, 1099 n.8 (1991) (issue actually decided by court below is properly presented in this Court).

The Federal Circuit rested its affirmance on the simple proposition that the jury "could have" relied on a nonpatent basis for its general tort verdicts that Honeywell interfered with Litton's license agreement and with Litton's prospective contractual relations. The Federal Circuit notably did *not* conclude that the jury in fact relied only on such a nonpatent basis. To the contrary, the Fed-

eral Circuit's own opinion—which specifically points to Louderback's use of "the patented method" for Honeywell as a breach of the license agreement induced by Honeywell (*id.* at 3a) and pointedly notes that the jury's patent-infringement finding "supports its determination that Honeywell used wrongful means" (*id.* at 28a)—explicitly confirms that the jury not only was permitted to rest its tort findings, but in all likelihood did rest them, on its view that Litton's patent had been infringed. *See also id.* at 146a (district court: "the jury found that Honeywell did use wrongful means in that it willfully infringed Litton's patent"). Indeed, as shown by the opinions of the dissent below (*id.* at 45a, 46a (failure of proof of any trade secrets or proprietary rights)), and of the district court (*id.* at 140a (same)), there is substantial reason to question the panel majority's ruling that the jury even *could* have properly rested its state-law findings on any legitimate nonpatent basis.

The Federal Circuit's holding—that the verdict must (or even may) be affirmed as long as the jury *could* have relied on a nonpatent basis—is wrong in precisely the circumstance that would be presented if the patent-infringement ruling rests on *legal* error (as our first two questions urge). This Court often has made clear that where one of several possible bases on which a jury may have rested a general verdict is legally defective (as opposed to factually unsupported by the evidence), a federal appellate court may not affirm: in that situation, there is no reliable way for the appellate court to know, and no sound reason to presume, that the jury avoided reliance on the legally defective basis offered in support of its verdict. *See, e.g., Griffin v. United States,* 502 U.S. 46, 59-60 (1991); *City of Columbia v. Omni Outdoor Advertising, Inc.,* 499 U.S. 365, 384 (1991); *Chiarella v. United States,* 445 U.S. 222, 237 n.21 (1980); *Sunkist Growers, Inc. v. Winckler & Smith Citrus Products Co.,* 370 U.S. 19, 29-30 (1962); *United New York & New Jersey Sandy Hook Pilots Ass'n v. Halecki,* 358 U.S. 613 (1959). Numerous circuit court decisions have, with apparent uniformity, likewise so held.

See, e.g., United States v. Miller, 84 F.3d 1244, 1257 (10th Cir. 1996); *United States v. Boots*, 80 F.3d 580, 589 (1st Cir. 1996); *United States v. Pettigrew*, 77 F.3d 1500, 1511 (5th Cir. 1996); *United States v. Vebeliunas*, 76 F.3d 1283, 1290 (2d Cir. 1996); *United States v. Barona*, 56 F.3d 1087, 1097 (9th Cir. 1995), *cert. denied*, 116 S. Ct. 813 (1996).

If the patent-infringement ruling in this case is set aside as resting on an improper legal foundation, the state-law affirmance by the Federal Circuit cannot properly stand. If the Court holds the present petition and then, in light of *Warner-Jenkinson*, grants certiorari, vacates the Federal Circuit's judgment, and remands for reconsideration, we respectfully suggest that the state-law aspect to the judgment should be summarily corrected in the order of remand. The Federal Circuit advanced no analysis to support its plainly incorrect, and apparently unprecedented, ruling that a general verdict must be affirmed even if, as the Federal Circuit's opinion establishes, the jury likely relied on a legally erroneous basis for the verdict. Full correction of the judgment, as well as efficient judicial administration, supports inclusion in a remand order from this Court of a clarification that the state-law verdicts should be vacated if the patent-infringement finding is ultimately disturbed as legally erroneous.

CONCLUSION

The petition for a writ of certiorari should be granted.

Respectfully submitted,

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November 26, 1996

APPENDICES

APPENDICES

APPENDIX A

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

Nos. 95-1242, 95-1311

LITTON SYSTEMS, INC.,
Plaintiff-Appellant,

v.

HONEYWELL, INC.,
Defendant/Cross-Appellant.

July 3, 1996

Before NEWMAN, RADER, and BRYSON, Circuit Judges.

RADER, Circuit Judge.

Litton Systems, Inc. (Litton) appeals a decision of the United States District Court for the Central District of California. After a jury verdict in favor of Litton, the trial court determined as a matter of law that Honeywell did not infringe Litton's U.S. Patent No. Re. 32,849 ('849 reissue) and U.S. Patent No. 4,142,958 (the '958 patent). The trial court also held the '849 reissue unenforceable for inequitable conduct. With respect to federal law claims, the trial court applied the doctrine of

intervening rights and granted Honeywell a new trial on damages.

With respect to state law claims, the trial court granted Honeywell's motion for judgment as a matter of law (JMOL) on intentional interference with contractual relations and intentional interference with prospective economic advantage. Because substantial evidence supports the jury verdict, this court reverses the trial court's grant of JMOL. However, this court affirms the trial court's finding of intervening rights and its decision to grant a new trial on damages.

BACKGROUND

On April 13, 1978, Litton filed a patent application on a method for coating a substrate with multiple layers of materials to form an optical component. This method uses ion beams to coat optical material with multiple layers. The result is an almost perfectly reflective mirror. These nearly perfect mirrors are essential components in sophisticated ring-laser gyroscopes (RLGs) used for navigational control of aircraft. An RLG shoots two laser beams in opposite directions around a ring of mirrors and measures any differences in their time of traversing the circle. After measuring these differences in three different axes, the RLG precisely calculates the speed, direction, and attitude of the aircraft. Without nearly perfect mirrors, this navigational device will not perform. The patented process produces high stability mirrors by ion-beam sputtering.

During prosecution of its 1978 application, Litton did not submit prior art to the Patent and Trademark Office (PTO). The application designated two Litton employees, Dr. David T. Wei (Wei) and Anthony W. Louderback (Louderback), as the inventors, with Litton as the assignee. This patent application issued as the '958 patent on March 6, 1979.

In 1981, Louderback left Litton to form his own optical coating company, Ojai Research, Inc. (Ojai). Nonetheless Louderback preserved his relationship with Litton by entering a licensing and an exclusive consulting agreement with his former employer. The licensing agreement permitted Louderback to practice the '958 patent. Indeed Louderback began supplying Litton mirrors for RLGs. The licensing agreement forbade Louderback to use the patented technology to make RLG mirrors for anyone other than Litton.

Louderback's exclusive consulting contract lasted until February 25, 1983. Under this agreement, Litton owned any inventions, developments, or discoveries Louderback made on the licensed process. The agreement also forbade Louderback from disclosing the patented technology.

During the exclusive consulting agreement with Litton, Louderback made improvements and modifications to the Litton process. Louderback developed multiple-layer optical films with graded interfaces between the layers of the mirrors. This advance used a sliding target holder to apply the layers. The sliding target holder moved gradually from one target to another to create a graded interface between the layers. Under the terms of the consulting agreement, Litton owned these improvements. Louderback violated this agreement by withholding this improvement from its rightful owner, Litton.

Louderback testified that he provided Honeywell with RLG mirrors from 1984 to 1990. Louderback made these mirrors with the patented method. This action also expressly violated both the licensing and consulting agreements with Litton.

Honeywell used the RLG mirrors from Louderback in navigational systems for Boeing aircraft. Before switching to the ion-beam mirrors supplied by Louderback, Honeywell used electron-beam (E-beam) coated mirrors. In

1983, Honeywell began to suffer problems with these E-beam mirrors. Mr. Podgorski of Honeywell testified that Boeing rejected over twenty percent of Honeywell's mirrors for failure. Because of reflectivity problems, Honeywell switched to Louderback's ion-beam mirrors.

The record fully documented the nature of the mirror problems which prompted this switch. In an interoffice memo dated November 1, 1983, Mr. Seiber, a Honeywell employee noted a "real problem with photochromism and loss stability of the E-beam mirrors." He warned that "a significant fraction, 25%, of the mirrors are photochromic and that most if not all further degrade with gyro running time." In a 1984 memo, Mr. Stan Moeschl, a Honeywell Vice President, explained that the E-beam mirrors have a limited useful life.

These problems began to threaten Honeywell's standing with its major client, Boeing. Mr. Swanson, a Boeing executive, testified that his company knew of Honeywell's mirror problems. He testified that the malfunctioning navigational systems caused him real concern. Indeed Boeing returned many malfunctioning RLGs.

A Honeywell internal memo dated February 15, 1984, stated "the urgency is very great [to solve the problem]." Responding to this urgency, Honeywell initiated a business relationship with Louderback. Louderback enabled Honeywell to switch to the more reliable ion-beam mirrors. The record shows that the ion-beam mirrors were more durable than E-beam mirrors by two to three times. Honeywell ordered these mirrors from Ojai Research and General Optics, Inc.—both Louderback companies.

On July 2, 1985, during litigation with another party over RLG mirrors, Litton sought to reissue the '958 patent. Litton's reissue application incorporated dependent claim 2 into independent claim 1, thereby narrowing its scope. On August 30, 1985, Litton submitted a patent-

ability report citing eighty-two prior art references to the examiner.

The '958 patent reissued on January 31, 1989, as U.S. Patent No. Re. 32,849. The reissue patent contains two independent claims and twenty dependent claims. The two independent claims read:

> 1. A method of fabricating multiple layer optical films, said multiple layer optical films comprising optical layers having different indices of refraction comprising:
>
> bombarding targets obliquely with an ion beam produced by or derived from a Kaufman-type ion beam source in a vacuum chamber to sputter deposit a plurality of optical film layers on a base;
>
> controlling the atmosphere inside the vacuum chamber to provide sufficient gas to sustain the ion beam and the proper amount of oxygen to accomplish proper stoichiometry of the thin films; and
>
> depositing multiple layers of different materials on said base by varying the targets being bombarded by the ion beam; and
>
> continuously rotating said base during the deposition of said multiple optical layers.
>
> 18. A method of fabricating multiple layer optical films said multiple layer optical films comprising at least two optical layers having different indices of refraction, in alternating layers, comprising:
>
> bombarding at least two targets comprising materials having different indices of refraction obliquely with an ion beam produced by or derived from Kaufman-type ion beam source in a vacuum chamber to sputter deposit a plurality of optical film layers comprising said materials in alternating layers on a base;
>
> controlling the atmosphere inside of the vacuum chamber to provide sufficient gas to sustain the ion

beam and the proper amount of oxygen to accomplish proper stoichiometry of the thin films;

depositing multiple layers of said materials having different indices of refraction on said base by varying the targets being bombarded by the ion beam; and

continuously rotating said base during the deposition of said multiple optical layers.

Dependent claim 3 specifies that the claim 1 process may use the ion beam to clean the substrate. Dependent claims 4-7, 9-12, and 14-16 vary the parameters of claim 1 in making a mirror. Dependent claim 8 discloses a cooling method for the process. Dependent claim 9 shows a low expansion ceramic substrate. Dependent claims 13 and 17 describe a method with fewer impurities and voids. Dependent claims 19-22 claim ways to reduce surface anomalies, voids, and impurities.

In 1990, Litton sued Honeywell, Louderback and Ojai for infringement of the '849 reissue. Litton asserted Louderback had infringed the '849 reissue and breached their licensing and consulting agreements. Litton later amended the complaint to sue Honeywell for intentional interference with contractual relations and intentional interference with prospective economic advantage. In September 1990, the trial court entered judgment against Louderback. The court determined that the mirrors Louderback supplied to Honeywell infringed the '849 reissue and breached the licensing agreement. In October 1991, the court clarified that this order did not apply to Honeywell. Thus, Honeywell and Litton went to trial.

The jury trial lasted three and a half months. The jury then deliberated for three and a half weeks, returning with a verdict on August 31, 1993. In the special verdict form, the jury reported that Honeywell did not prove any of the asserted claims invalid. It reported that Litton had

proved the asserted claims infringed. The jury also reported that Litton had met its burden on the state claims.

As for damages, Litton sought $1.96 billion in damages under a lost profits theory as a result of any of the three asserted claims. The jury reported each of Litton's asserted claims resulted in $1.2 billion in damages.

At the conclusion of the presentation of evidence to the jury and while the jury deliberated, the trial court tried the issue of inequitable conduct. That court held the '849 reissue unenforceable due to inequitable conduct by Litton. Honeywell renewed its motion for JMOL. The trial court granted Honeywell's motion finding the claims of the '849 reissue invalid as obvious under 35 U.S.C. § 103 (1994). In addition, the trial court granted Honeywell's renewed JMOL with respect to Litton's state law claims. The trial court denied Honeywell's motion on all other grounds. In the alternative, the trial court granted Honeywell a new trial on damages.

DISCUSSION

This court reviews without deference a trial court's grant of JMOL. *Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 756 F.2d 1556, 1560, 225 USPQ 253, 257 (Fed.Cir. 1985).[1] Where the trial judge reverses a jury verdict on a motion for JMOL, the appellant must show that substantial evidence supports the jury's factual findings which, in turn, support the jury's legal conclusions. *Baxter Healthcare Corp. v. Spectramed, Inc.*, 49 F.3d 1575, 1582, 34 USPQ2d 1120, 1125-26 (Fed. Cir.), cert. denied, —— U.S. ——, 116 S.Ct. 272, 133 L.Ed.2d 194 (1995). Sub-

[1] This court often describes the standard of review in this context as *de novo*. However, the use of the term *de novo* to describe our appellate function is a misnomer. As our sister circuit noted: "To consider a matter *de novo* is to determine it anew, as if it had not been heard before and no decision had been rendered." *Yepes-Prado v. INS*, 10 F.3d 1363, 1367 n. 5 (9th Cir.1993). By use of the term *de novo*, this court means that it does not defer to the "lower court ruling or agency decision in question." *Id.*

stantial evidence describes that minimum quantum of evidence from which a jury might reasonably afford relief. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 249, 106 S.Ct. 2505, 2510-11, 91 L.Ed.2d 202 (1986); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed.Cir.), *cert. denied*, 469 U.S. 857, 105 S.Ct. 187, 83 L.Ed.2d 120 (1984). Stated differently, a trial judge properly grants JMOL when the evidence permits only one reasonable conclusion as to the verdict. *Peterson v. Kennedy*, 771 F.2d 1244, 1252 (9th Cir.1985), *cert. denied*, 475 U.S. 1122, 106 S.Ct. 1642, 90 L.Ed.2d 187 (1986).

In reviewing the record, the trial judge may not account for witness credibility, weigh evidence, or vary from the jury's verdict, unless—viewing the evidence in the light most favorable to the nonmoving party—substantial evidence does not support that verdict. *Los Angeles Memorial Coliseum Comm'n v. National Football League*, 726 F.2d 1381, 1392 (9th Cir.), cert denied, 469 U.S. 990, 105 S.Ct. 397, 83 L.Ed.2d 331 (1984). The jury alone weighs conflicting evidence and the credibility of witnesses. *Transgo, Inc. v. Ajac Transmission Parts Corp.*, 768 F.2d 1001, 1024 (9th Cir.1985), cert. denied, 474 U.S. 1059, 106 S.Ct. 802, 88 L.Ed.2d 778 (1986); see also *Lytle v. Household Mfg.*, 494 U.S. 545, 554, 110 S.Ct. 1331, 1337-38, 108 L.Ed.2d 504 (1990). In applying the JMOL standard anew, this court is bound by these same constraints in testing the sufficiency of the evidence in support of the jury's verdict. *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821, 23 USPQ2d 1426, 1431 (Fed.Cir.1992).

Obviousness

Although the jury rejected Honeywell's challenges to the validity of Litton's patents, the trial court declared the patents invalid as a matter of law. This court reviews the trial court's decision to invalidate the '849 reissue with reference to the record evidence in support of the jury's verdict. *Baxter Healthcare*, 49 F.3d at 1582.

A patent claim is invalid as obvious if the differences between the claimed invention as a whole and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103. Resolution of this issue entails a difficult process of turning back the clock to a time when the invention was made and asking what one of ordinary skill in the art might have thought. As such, a number of facts inform the obviousness determination.

To review a determination of obviousness under section 103, this court examines underlying factual findings such as: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed subject matter and the prior art; and (4) the objective evidence of nonobviousness. *Ashland Oil, Inc. v. Delta Resins & Refractories,* 776 F.2d 281, 291, 227 USPQ 657, 662, (Fed.Cir.1985), *cert. denied,* 475 U.S. 1017, 106 S.Ct. 1201, 89 L.Ed.2d 315 (1986); *Perkin-Elmer,* 732 F.2d at 894. These factual findings guide the determination of whether the patented subject matter would have been obvious to one of ordinary skill in the pertinent art at the time of the invention. *Lear Siegler, Inc. v. Aeroquip Corp.,* 733 F.2d 881, 890, 221 USPQ 1025, 1033 (Fed.Cir.1984). Because all issued patent claims are presumed valid, the challenger must prove obviousness by clear and convincing evidence. *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc.,* 45 F.3d 1550, 1555, 33 USPQ2d 1496, 1499 (Fed. Cir.1995).

To determine whether an invention would have been obvious in light of the prior art requires one to compare the claimed "subject matter as a whole" with the prior art "to which [the] subject matter pertains." In re *Ochiai,* 71 F.3d 1565, 1569, 37 USPQ2d 1127, 1131 (Fed.Cir. 1995). This comparison, however, only provides part of

the relevant evidence. One must also examine the relevant historical facts and circumstances related to the claimed invention, such as commercial success, which tend to make it more probable than not that the subject matter of the invention would have been obvious. *Demaco Corp. v. F. Von Langsdorff Licensing, Ltd.*, 851 F.2d 1387, 1391, 7 USPQ2d 1222, 1226-27 (Fed.Cir.), *cert. denied*, 488 U.S. 956, 109 S.Ct. 395, 102 L.Ed.2d 383 (1988). As we expressly recognized in *Ochiai*, the obviousness inquiry is highly fact-specific and not susceptible to per se rules. 71 F.3d at 1569.

The Supreme Court has underscored the fact intensive nature of the test for obviousness. *Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 106 S.Ct. 1578, 89 L.Ed.2d 817 (1986). In Panduit, the petitioner alleged that this court overrode the trial court's factual determinations with its own factual views. The Supreme Court echoed the petitioner's concerns:

> While the ultimate question of patent validity is one of law . . . the § 103 condition [that is, nonobviousness] . . . lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unresolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

Id. at 810-11, 106 S.Ct. at 1579 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545 (1966)).

Scope and Content of Prior Art

In this case, the trial court found the '849 reissue obvious in light of the Laznovsky article, the Bernard patent (U.S. Patent No. 3,925,187), the products catalogs (Veeco 1975, Veeco 1977, and Commonwealth 1978), and the Molitor article. The PTO considered Laznovsky, Bernard, and two catalogs (Veeco 1977 and Commonwealth 1978) during reissue. Because Laznovsky discloses the entirety of the art in the Veeco 1975 catalog, only the art reflected in the Molitor article escaped PTO consideration.

The Molitor reference is a paper presented at the American Institution of Aeronautics and Astronautics International Electric Propulsion Conference in November 1976. The paper primarily describes possible propulsion systems for space vehicles. Mr. Hutchings, Senior Director in Litton's Guidance and Control Section, testified that space vehicle propulsion principles are remote from a ring laser gyro scientist's discipline. As he noted, a ring laser gyro scientist works with optics and the interaction of optical waves with solids. Aeronautic and astronautic propulsion does not address the interaction of light waves with solids. The record thus supports the proposition that these fields are, at best, distant cousins. In other words, the record contains substantial evidence that Molitor is not analogous art relevant to the problems of RLG mirrors. *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 719, 21 USPQ2d 1053, 1057-58 (Fed.Cir.1991); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 449, 230 USPQ 416, 420 (Fed.Cir.1986), *cert. denied*, 484 U.S. 823, 108 S.Ct. 85, 98 L.Ed.2d 47 (1987). Even if a ring laser gyro scientist read the Molitor reference, Mr. Hutchings stated that Molitor does not disclose the use of a Kaufman-type gun in ion-beam sputtering. In its single reference to ion beams to affect solids, Molitor shows a chamber with a duoplasmatron system. Molitor does not describe coating a substrate; it

discusses etching or cutting away material. In sum, the record supports a finding that a ring laser artisan at the time of this invention would not find Molitor pertinent to the problems of mirror reflectivity.

Thus, a reasonable jury could find that Molitor is not analogous art. Accordingly, this court determines that the jury committed no error to the extent it excluded Molitor from the scope of analogous art in its obviousness determination.

Level of Ordinary Skill

The trier of fact determines the level of ordinary skill in the relevant art to ensure proper objectivity at the outset of the obviousness inquiry. *Ryko*, 950 F.2d at 718. In this case, the trial court found that a person of ordinary skill in the precision coating art would have had at least a bachelor's degree in physics or engineering with some experience in vacuum deposit technology. The record supports this finding, which neither party contests.

Differences Between Claims and Prior Art

Claims 1 and 18 of the '849 reissue claim a method for fabricating multiple layer optical films with different or alternating indices of refraction. Dependent claims 4-5 claim a method for building a laminated optical film with specified indices of refraction. Dependent claim 7 discloses a method for making a multi-layer mirror with alternating quarter-wave layers. Dependent claims 11-13 and 15-17 describe a method of fabricating RLG mirrors by ion-beam deposition. Dependent claims 19-22 claim ways to reduce surface anomalies, voids, and impurities.

The Laznovsky article emerged in the Research and Development magazine in August 1975 under the title "Advances in Low Energy Ion Beam Technology." Laznovsky describes new applications for ion-beam emitters. One diagram in the article shows a device for ion-beam deposition by sputtering. The diagram shows ion

beams bombarding a water-cooled target at about a 45-degree angle. The target rotates to provide a uniform coating. The target also rotates to different angles for etch-cleaning or other purposes. Laznovsky also teaches that ion-beam sputtering of oxidic targets may cause a loss of oxygen, requiring addition of that gas into the vacuum chamber.

A comparison to the claims, however, reveals that Laznovsky does not disclose coating optical films with multiple layers of different or alternating indices of refraction. In fact, Laznovsky does not teach multiple layer coating at all. The target in Laznovsky rotates into different positions, but not to accommodate multiple layer deposition.

The Bernard patent also discloses an apparatus for forming coatings on a substrate. Bernard, however, uses a duoplasmatron beam, not a Kaufman-type beam as specified by the '849 reissue. In addition, the Bernard patent limits its discussion to forming multiple layer coatings on microelectronic or semi-conductor devices, not optical films. Furthermore, the reference does not disclose a rotating substrate for deposition of multiple layers.

The Veeco catalogs disclose the use of ion-beam systems for etching and deposition of metals, semiconductors, insulators, or superconductors. Unlike the claimed invention, the Veeco Catalogs do not disclose the deposition of multiple-layer optical films. Further, the Veeco art does not disclose the introduction of oxygen to assure proper stoichiometry of oxidic films. The record supplies these differences. For example, even Honeywell's own witness, Mr. Garmire, admits that the 1975 Veeco Catalog does not mention "multiple layer optical films."

As discussed above, the Molitor article—even if analogous art—does not disclose the use of a Kaufman-type gun or the deposition of multiple layers. Molitor passingly discloses etching and not deposition.

In sum, the record shows that none of the prior art references, alone or in combination, teach or suggest a method for fabricating a multiple-layer optical film with different or alternating indices of refraction, using a Kaufman-type beam for ion-beam sputtering. The prior art simply does not contain many limitations in the claimed method. Furthermore, the record discloses no teaching or suggestion to combine any of these references. The absence of a suggestion to combine is telling in an obviousness determination. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 886-87, 8 USPQ2d 1468, 1475 (Fed.Cir.1988).

Objective Indicia of Nonobviousness

As noted above, objective indicia of nonobviousness, when present, are invariably relevant to the determination under section 103. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538, 218 USPQ 871, 879 (Fed.Cir. 1983) (citations omitted). Objective considerations may often be the most probative and cogent evidence of nonobviousness in the record. *Id.* To acquire "substantial significance in an obviousness decision," however, evidence of objective consideration must include a nexus to the merits of the claimed invention. *Cable Elec. Prods. v. Genmark, Inc.*, 770 F.2d 1015, 1026, 226 USPQ 881, 887 (Fed. Cir.1985).

Several objective indicia of nonobviousness arise in this case. For instance, the record indicates that Honeywell copied Litton's '849 reissue technology. Litton presented at trial Honeywell's memo dated 2/7/80 regarding Advanced Mirror Technology:

> The bottom line is to do a full scale, roughly one year program to solve our mirror problems and guarantee a production position by January, 1981. . . . [An approach to be taken is to] duplicate Litton's process, using sputtering.

Litton presented the Honeywell memo regarding a 1989 ASM International Engineering Materials Achievement Award. This memo states that Honeywell's "ion beam sputtering mirror deposition technology is only possible through the development of the ion gun originally developed for interplanetary propulsion by H. Kaufman. . . . [I]t was first applied to the fabrication of high quality mirrors by T. Lauderback [sic] at Litton." These memos support Litton's assertion that Honeywell copied Litton's process for high quality mirrors.

The patented invention also received tributes from other skilled scientists for its contribution to RLG technology. *See W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1555-56, 220 USPQ 303, 315 (Fed.Cir.1983), *cert. denied*, 469 U.S. 851, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984). For instance, Dr. Pulker, an associate professor at Innsbruck University and Director of Research at Balzars,[2] testified that the patented technology produces a perfect optical layer. He characterized the patent as pioneering. Further Balzars paid Litton a twenty percent royalty for the technology. Before this litigation, Honeywell also praised ion-beam deposition as the critical feature for reliable RLGs and credited Litton with discovering the method for RLG mirrors.

Both Litton and Honeywell enjoyed commercial success with the patented method. Litton captured about seventy percent of the military market for guidance systems. Moreover, Honeywell admitted that ion-beam mirrors are critical to its billion-dollar industry. Although Honeywell acquired its lucrative Boeing contract at a time when it used E-beam mirrors, the record supports the reasonable inference that E-beam mirror failure jeopardized this commercial success until Honeywell acquired the reliable ion-beam mirrors from Louderback.

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[2] Balzars is a company with its headquarters in Liechtenstein and factories in Boston and Tokyo. It makes pumping systems, coating systems, optical coatings, and micro electronics.

Finally the record shows that Honeywell, Balzars, and other companies, repeatedly tried to build durable E-beam mirrors, yet failed. The industry sought stable mirrors for RLG systems, until Litton's patented technology proved to satisfy the need for dependable mirrors.

In sum, the record supplies ample objective evidence linked to the patented technology for its nonobviousness. The record shows copying, tributes to the patent, licenses, commercial success, failures of others, to name a few. This probative evidence provides valuable insight into how the person skilled in the art would have viewed the claimed invention at the time it was made.

Because substantial evidence supports the jury's verdict that the claims of the '849 reissue were not invalid for obviousness—a highly fact-specific inquiry—this court reverses the trial court's determination of obviousness and reinstates the jury's verdict.

Inequitable Conduct

Inequitable conduct is the failure to disclose material information, or the submission of false material information, with an intent to deceive. Both materiality and intent must be proven by clear and convincing evidence. *Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 872, 9 USPQ2d 1384, 1389 (Fed.Cir. 1988) (en banc), *cert. denied*, 490 U.S. 1067, 109 S.Ct. 2068, 104 L.Ed.2d 633 (1989).

The standard for materiality is whether a reasonable examiner would consider the omission or misrepresentation important in deciding whether to issue the application as a patent. *Fox Indus., Inc. v. Structural Preservation Sys., Inc.*, 922 F.2d 801, 803, 17 USPQ2d 1579, 1580 (Fed. Cir. 1990). A reference that is merely cumulative to other references, however, is not material. *Halliburton Co. v. Schlumberger Technology Corp.*, 925 F.2d 1435, 1440, 17 USPQ2d 1834, 1839 (Fed.Cir.1991).

Beyond materiality, inequitable conduct requires proof of intent. *Id.* at 1442. The purported inequitable conduct —viewed in light of all the evidence, including evidence of good faith—must display sufficient culpability to require a finding of intent to deceive. *Kingsdown,* 863 F.2d at 876. Finally, materiality and intent affect each other. The more material the omission or misrepresentation, the less intent required and vice versa. *Halliburton,* 925 F.2d at 1439.

While inequitable conduct falls within the discretion of the trial court, *Kingsdown,* 863 F.2d at 876, that exercise of discretion cannot rest on clearly erroneous findings of facts or on a misunderstanding of the law. *Manville Sales Corp. v. Paramount Sys., Inc.,* 917 F.2d 544, 551, 16 USPQ2d 1587, 1592 (Fed.Cir.1990) (citing *Kingsdown,* 863 F.2d at 872).

The trial court found no inequitable conduct in the '958 patent. This court agrees. The trial court, however, abused its discretion in finding inequitable conduct in the '849 reissue. The trial court found inequitable conduct in three acts: (1) misleading statements in the Baumeister declaration; (2) withholding disclosure of Laznovsky; and (3) burying of the Veeco Catalogs disclosure in a footnote during the prosecution.

The trial court portrayed the Baumeister declaration as an instance of deceptive conduct:

> Baumeister's declaration did not present any new facts or arguments to distinguish the invention from the prior art, but rather provided the examiner with the testimony of a man who was represented to be a person of great skill in the pertinent art. Baumeister's testimony at trial proved beyond question that he was not such a person.

The trial court also stated that Baumeister convinced the examiner to reverse his rejection of the application. The trial court determined that Baumeister's declaration delib-

erately misled the examiner by omitting his lack of experience with the claimed technology.

The trial court both overestimated and misconstrued the Baumeister declaration. The Baumeister declaration was only one of four different declarations on which the examiner based allowance of the '849 reissue claims. Furthermore, the declaration does not misstate Mr. Baumeister's qualifications. He is an academic whose specialty is optical coatings. He led a university research team to obtain mirrors having the highest possible reflectivity. He did not purport to have expertise in ion-beam deposition. In sum, Baumeister professed no more than his actual qualifications. He did not ever profess experience with a duoplasmatron or ion-beam. Despite the trial court's insinuation, the examiner could not have attributed false qualifications to Baumeister. The trial court clearly erred in finding an intent to deceive in the Baumeister declaration, which contained no misleading or even exaggerated claims concerning Baumeister's qualifications.

The trial court also found that Litton intentionally withheld the Laznovsky reference from the examiner. This finding cannot support inequitable conduct because the examiner received and considered Laznovsky during reissue. An applicant cannot intentionally withhold a reference actually considered by the PTO, even though the applicant may not have disclosed the art. *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1185, 33 USPQ2d 1823, 1832 (Fed.Cir.1995) (quoting *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1582, 18 USPQ2d 1001, 1015 (Fed.Cir.1991)). Thus, because Laznovsky was before the examiner, the applicant did not intentionally withhold the reference. Moreover, relative to the issue of culpable intent, the record does not disclose that anyone involved in the prosecution at Litton knew of Laznovsky. Once again, the trial court abused its discretion by refusing to enforce the patent without a showing of culpable conduct. Finally, the trial court found

culpable Litton's citation of the Veeco catalogs in a footnote of the patentability report. The trial court saw in this disclosure a substantial violation of the duty of candor. To the contrary, the Veeco catalogs are cumulative to Laznovsky and Westwood, both of which were before the examiner during reissue. Because cumulative references are not material, the footnote language cannot amount to a substantial violation of the duty of candor. *Id.* at 1582. The trial court clearly erred by discerning culpable conduct in failure to disclose cumulative references.

Because the trial court based inequitable conduct on clearly erroneous findings, it abused its discretion. This court reverses the trial court's finding of inequitable conduct.

Infringement

Infringement, whether literal or by equivalents, is a question of fact. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1520, 35 USPQ2d 1641, 1647 (Fed.Cir.1995) (en banc) (citations omitted), *cert. granted*, —— U.S. ——, 116 S.Ct. 1014, 134 L.Ed.2d 95 (1996). Thus, this court reviews a jury verdict of infringement for substantial evidence. *Id.* at 1521.

The jury found that both Honeywell's hollow cathode and radio frequency (RF) ion-beam source processes infringed the '849 reissue both literally and by equivalents. The trial court found sufficient evidence to support infringement by equivalents for the hollow cathode process, but not for the RF ion-beam process. The trial court found no literal infringement for either process.

"An accused product that does not literally infringe a claim may infringe if it has insubstantial changes from the patented device." *Sofamor Danek Group, Inc. v. DePuy-Motech, Inc.*, 74 F.3d 1216, 1221, 37 USPQ2d 1529, 1532 (Fed.Cir.1996) (citing *Hilton Davis*, 62 F.3d at 1518-19). In this case, the trial court used the

function-way-result test (FWR) of *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950), for its equivalents analysis. In *Hilton Davis*, this court explained the appropriate application and circumstances surrounding this test. *Hilton Davis*, 62 F.3d at 1512. In *Sofamor*, this court articulated this test:

> *Hilton Davis* says it goes too far to describe that the function-way-result test as "the test" for equivalents. Evidence beyond function, way, and result informs application of the doctrine, which focuses on the substantiality of changes from the claims in the accused device. One of ordinary skill in the relevant art provides the perspective for assessing the substantiality of differences between the claims and the accused device. The test is objective with proof of the substantiality of the differences resting on objective evidence. This court commends, for instance, evidence that persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was. If the parties, however, presented primarily evidence of FWR, this presentation may suffice to satisfy the doctrine of equivalents.

Sofamor, 74 F.3d at 1222 (citations and quotations omitted).

In this case, the trial court agreed that substantial evidence supports infringement by Honeywell's hollow cathode process under the doctrine of equivalents. Although lacking a hot wire, the hollow cathode source is a Kaufman-type source recited in the '849 reissue claims. The claims require a "Kaufman-type" source, not a Kaufman ion gun. At the time of the original Louderback-Wei application, the claims recited "Kaufman-type" to distinguish this ion-beam source from a duoplasmatron—the other available source at that time. The record shows that by the 1980s, commercial beam sources used hollow

cathode ionization as substitutes for the earlier Kaufman guns. By the 1990s, the beam source art advanced to include RF ionization as substitutes for the earlier Kaufman guns.

The trial court found that Honeywell's hollow cathode ion-beam source performs substantially the same function as the Kaufman-type ion-beam source in the '849 reissue in substantially the same way for the same result. Indeed several experts testified that at the time of infringement one of ordinary skill in the art would know that a hollow cathode source is fully interchangeable for a "Kaufman-type" source. The record amply supports the trial court's determination.

Honeywell also used an RF ion-beam source for the sputtering process. The trial court described the principal elements of a Kaufman-type ion-beam source as a hot wire cathode, an anode, and magnets and grids. Honeywell's RF ion-beam source has no electron emitting element inside the discharge chamber, such as a cathode. This RF ion beam accordingly did not produce ions in the same way as the Kaufman-type ion-beam source. Nonetheless, the record showed that Honeywell's RF ion-beam source produced a beam and a result substantially similar, if not identical, to the Kaufman-type ion beam.

Experts similarly testified to the known interchangeability of an RF source with a "Kaufman-type" source at the time of infringement. Honeywell's use of the RF ion-beam source is an insubstantial change, under the doctrine of equivalents, from the Kaufman-type ion-beam source described in the '849 reissue claims. Because substantial evidence supports the jury's verdict of infringement by equivalents by Honeywell's RF ion-beam process, this court reinstates the jury verdict.

Intentional Interference with Contractual Relations

Litton claims that Honeywell tortiously induced Louderback to violate his licensing agreement.[3] The jury agreed. Honeywell filed a motion for JMOL claiming that the record did not support the jury's verdict. The trial court agreed and granted the motion. Specifically, the trial court discerned "a total absence of proof that Louderback ever actually used any Litton trade secrets in manufacturing mirrors for Honeywell." The elements of intentional interference with contractual relations are: (1) a valid contract between the plaintiff and a third party; (2) the defendant's knowledge of this contract; (3) the defendant's intentional acts to induce a breach or disruption of the contractual relationship; and (4) resulting damage. *Pacific Gas & Elec. Co. v. Bear Stearns & Co.*, 50 Cal.3d 1118, 270 Cal.Rptr. 1, 791 P.2d 587 (1990).

With respect to the first element of the intentional interference tort, Litton and Louderback entered into a valid licensing agreement in April 1981. The licensing agreement permitted Louderback to use the '958 process. The agreement, however, prevented him from selling any products manufactured by the process to anyone other than Litton. Until February 1983, Louderback was also an exclusive consultant to Litton. Under his consulting agreement, Louderback granted Litton "all rights in all inventions, developments and discoveries (whether or not patentable) made during the period of the consulting agreement . . . including but not limited to modification and improvements to the patented ion beam process."

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[3] The majority does not premise its conclusion regarding the state law claims on the existence of a patent. Consequently, intervening rights has no bearing on our holding. Furthermore, the jury could have determined that the information was a trade secret or was entitled to protection under unfair competition. The dissent reads Cal. Bus. & Prof.Code § 16600 more narrowly than the majority. It is the duty of the appellate court to sustain a jury verdict under any reasonable theory.

The consulting agreement further restricted Louderback from supplying competitors any parts or services for coating substrates in optical instruments or high power laser applications.

The record shows that Louderback breached the terms of both the licensing and consulting agreements. Louderback testified that he "set up [his] system in Ojai . . . with a sliding target mechanism that was capable of creating gradient index films" without notifying Litton of his improvement. Ultimately Louderback admitted using this design to make ring laser gyro mirrors for Honeywell. Because Litton was the rightful owner of both the patented method and Louderback's improvement, Louderback used Litton technology in violation of his agreements when he sold RLG mirrors to Honeywell.

With respect to the second element of the tort, the record shows that Honeywell knew of the Louderback-Litton license agreement at least as early as 1982. In an April 1982 telephone log, Dennis Morreli, a Honeywell employee, reported: "Lauderbach [sic] is on license to Litton and cannot make coatings for anyone other than Litton." This record corroborates Louderback's testimony that he advised Honeywell of the restrictions in his license with Litton.

A June 1984 internal memorandum also documents Honeywell's knowledge of Louderback's agreements with Litton: "Louderback had admitted to Litton trade secrets in taking license. If we buy or license process we are liable! Can get large lawsuit!" The memo further states: "Louderback—Next Steps. Discuss possibility of license or buy of process. . . . Evaluate potential lawsuit by independent assessment—patent attorney?" This memo, created in advance of any purchase of products from Louderback, verifies Honeywell's awareness of the risks of association with Louderback. Another memo, dated June 6, 1986, restates Honeywell's knowledge: "Litton owns idea of 'IB gyro'. . . . Issue may be 'proprietary violation' rather than patent!"

The record, therefore, supports the jury's finding that Honeywell knew of Louderback's agreements with Litton and knew those agreements protected the RLG mirror methods. Nonetheless Honeywell proceeded to deal with Louderback.

The third element of this tort requires proof that Honeywell intended to induce a breach or disrupt Litton's contract with Louderback. In a special verdict, the jury determined that Honeywell "did use wrongful means." In reaching this verdict, the jury could have reasonably relied on evidence that Honeywell offered to indemnify Louderback. During negotiations with Honeywell, Louderback testified that he expressed his fear that Litton would sue. Louderback asked Honeywell President Pete Smith to assign Honeywell's legal department to determine whether Louderback's ion-beam coating process would infringe Litton's patent rights. Louderback testified that Mr. Smith assured him that this precaution would not be necessary. Later, according to Louderback's testimony, Honeywell's Mr. Rostal promised him that Honeywell would cover "his legal costs and any damages." At that point, Louderback testified that he felt comfortable entering a contract to make mirrors for Honeywell. Although Honeywell insisted it merely promised to be a party to any lawsuit, the jury could reasonably give Louderback's testimony greater credibility. Finally, as to the element of resulting damages, this court finds that substantial evidence supports the jury's verdict as to resulting damages due to the intentional interference with contractual relations.

The record confirms that substantial evidence supports each of the elements of the tort of intentional interference with contractual relations. Accordingly, this court reinstates the jury verdict.

Intentional Interference with Prospective Economic Advantage

The jury found that Honeywell interfered with Litton's prospects of selling laser ring gyros to Boeing, Airbus, and McDonnell Douglas. The trial court disagreed and granted Honeywell's motion that the law precluded a finding of interference.

The elements for intentional interference with prospective economic advantage are: (1) an economic relationship between the plaintiff and a third party with probability of ripening into a future economic benefit for the plaintiff; (2) knowledge of the defendant about this relationship; (3) intentional acts by the defendant to disrupt the relationship; (4) actual disruption of the relationship; and (5) damages proximately caused by the defendant's acts. *Buckaloo v. Johnson,* 14 Cal.3d 815, 122 Cal.Rptr. 745, 537 P.2d 865, 872 (1975). These elements presuppose "a 'colorable economic relationship' between the plaintiff and a third party with 'the potential to develop into a full contractual relationship.' " *Aydin Corp. v. Loral Corp.,* 718 F.2d 897, 904 (9th Cir.1983) (quoting *Buckaloo,* 122 Cal.Rptr. at 753, 537 P.2d at 873). Evidence of the prospective relationship need not take the form of an offer, but must specifically show the possibility of future economic association. *Id.*

Litton contended that Honeywell's infringement of the '849 reissue interfered with Litton's prospective relationships with Boeing, McDonnell Douglas, and Airbus. Specifically, Litton presented evidence that Honeywell excluded Litton from competition in the RLG market by copying its technology, inducing Louderback to violate his agreements, and selling below Litton's cost.

The record supports an inference of future economic association between Litton and the airframe manufacturers because only Honeywell and Litton competed in the RLG market. With only two suppliers in the market,

customers would have necessarily sought reliable products from Litton in the absence of Honeywell. Mr. Swanson, Program Manager of the Material Division of Boeing, verified this reasoning. He testified that Honeywell and Litton were the only two companies trying to sell Boeing an RLG System. If Honeywell had not fixed its mirror problem, according to Mr. Swanson, Litton would have taken over the Boeing contract.

Honeywell won the competition to supply RLGs for the Boeing 757/767 in 1977. Boeing then extended this contract up through 1997 without another competition. The November 14, 1985 extension made Honeywell's inertial navigation systems standard on Boeing's 757, 767, and 737-300 aircraft. In the event the Honeywell systems were not satisfactory, however, these contracts reserved to Boeing the right to seek an alternate source. More specifically, Mr. Swanson testified, that alternate source was Litton.

Supplying further evidence for the first element of this tort, Mr. Mahler, President of Litton Aero Products, testified that only Litton Aero Products and Honeywell competed for the sale of RLGs to Boeing, Airbus, McDonnell Douglas and others. Mr. Sutton of Honeywell admitted that in 1986 Litton was the only competitor in the ring laser-based gyro, both in the military and commercial markets.

The record contains substantial evidence to support the jury's finding of prospects for an economic relationship between Litton and the aircraft makers with the probability of future economic benefits for Litton. The same record evidence of a two-supplier market supports the jury's finding on the second element of this tort. With only two competitors in the market and contracts which gave Boeing the option to seek RLGs from alternate sources, Honeywell knew of Litton's prospects for future economic relationships and benefits.

The third element of this intentional interference claim requires intentional acts by the defendant designed to disrupt the relationship. The jury found that Honeywell both infringed Litton's '849 reissue and intentionally interfered with contractual relations between Louderback and Litton.

In response, Honeywell asserts the privilege of free competition as an affirmative defense.[4] To invoke this privilege against interference with economic advantage, however, a competitor may not use "wrongful means." The

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[4] California adopted the definition of this privilege in the Restatement of Torts, Second, § 768:

> (1) One who intentionally causes a third person not to enter into a prospective contractual relation with another who is his competitor or not to continue an existing contract terminable at will does not interfere improperly with the other's relation if (a) the relation concerns a matter involved in the competition between the actor and the other; (b) the actor does not employ wrongful means and (c) his action does not create or continue an unlawful restraint of trade; and (d) his purpose is at least in part to advance his interest in competing with the other.

A-Mark Coin Co. v. General Mills, Inc., 148 Cal.App.3d 312, 195 Cal.Rptr. 859, 867 (1983). "Where no breach of contract is shown the law recognizes a more extensive privilege to interference with business relations." *Charles C. Chapman Bldg. Co. v. California Mart*, 2 Cal.App.3d 846, 82 Cal.Rptr. 830, 837 (1969). This broader privilege recognizes the right to compete in business. California courts have held:

> [F]or a claim of interference with prospective economic advantage, there must be something more than bona fide competition. The cases have turned almost entirely upon the defendant's motive or purpose, and the means by which he has sought to accomplish it. As in the case of interference with contract, any manner of intentional invasion of the plaintiff's interest may be sufficient if the purpose is not a privileged one.

Summit Machine Tool Mfg. Corp. v. Victor CNC Sys., Inc., 7 F.3d 1434, 1442 (9th Cir.1993) (quoting 5 Witkin, Summary of California Law § 652, at 741 (9th ed.)).

jury expressly found that Honeywell used wrongful means. The evidence that Honeywell intentionally interfered with contractual relations between Louderback and Litton supports this finding. The record provides details of Honeywell's difficulties with E-beam mirrors and its incentive to solve this problem. Honeywell's inducements to Louderback solved that problem by supplying ion-beam mirrors. This aspect of the record shows motivation for Honeywell to use wrongful means. The jury's finding of infringement also supports its determination that Honeywell used wrongful means.

Because it used wrongful means to gain a competitive advantage over Litton, Honeywell cannot invoke the privilege of free competition. Without this privilege, the record supplies substantial evidence to support the jury's determination that Honeywell intentionally disrupted Litton's economic prospects by inducing Louderback's unlawful cooperation and infringing Litton's patents.

Finally, the last two elements of this tort were demonstrated. The fourth element requires actual disruption of Litton's prospective economic relationship with airframe manufacturers, and the fifth element requires that defendant's acts proximately cause plaintiff's damages. Once again, the two-supplier market comes into play. The record contains numerous statements from both Litton and Honeywell executives acknowledging that only their two companies competed in the RLG mirror market. In 1986, Honeywell used "wrongful means" to convert to ion-beam mirrors. Those wrongful means included both interference with the Louderback-Litton contracts and infringement. Without these wrongful means, Litton would have been the sole alternative for the airframe manufacturers to acquire reliable navigational systems. Thus, the two-supplier market construct adequately supports the jury's finding that Honeywell disrupted Litton's prospects for successful business with the aircraft companies and consequently was the proximate cause of Litton's damages.

The record again confirms that substantial evidence supports the jury verdict on this tort claim. Thus, the standard of review requires this court to reinstate the jury's verdict.

DAMAGES

Having reinstated the jury's verdicts on the liability issues, this court now turns to damages. Litton alleged three alternative breaches of duty owed to it by Honeywell arising out of certain contracts that Litton contended it lost to Honeywell—patent infringement, interference with contractual relations, and interference with prospective economic advantage. Litton sought a total of $1.96 billion in damages under a theory of lost profits. The jury awarded $1.2 billion in damages under each of the three alternative theories of liability. In other words, the jury found any one of the three theories resulted in damages in the amount of $1.2 billion.

Honeywell moved for a new trial on damages under Fed.R.Civ.P. 59 in connection with its JMOL. The trial court granted Honeywell's motion.

Rule 59 allows a trial court to grant a new trial on all or part of the issues tried to a jury "for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States." Fed.R.Civ.P. 59(a). As one of the permissible reasons, a trial court may grant a new trial when the verdict is against the great weight of the evidence. *Byrd v. Blue Ridge Rural Elec. Coop., Inc.*, 356 U.S. 525, 540, 78 S.Ct. 893, 902, 2 L.Ed.2d 953 (1958). The court may thus grant a new trial even where substantial evidence supports the verdict if the verdict is against the clear weight of evidence. *Landes Constr. Co. v. Royal Bank of Canada*, 833 F.2d 1365, 1371 (9th Cir.1987); See *Poynter by Poynter v. Ratcliff*, 874 F.2d 219, 223 (4th Cir.1989); 11 Charles A. Wright, et al., Federal Practice and Procedure § 2806, at 65-66 (1995). Said another

way, the evidence presented may have been sufficient to support the jury verdict. Nevertheless, the trial judge can grant a new trial. This discretionary authority is aided in part by the ability of the trial judge to "weigh the evidence and assess the credibility of witnesses." *Landes*, 833 F.2d at 1371. Unlike a JMOL, the trial judge need not view the evidence from the perspective most favorable to the prevailing party. *Id.*

The decision to grant or deny a new trial rests with the sound discretion of the trial court. Thus, this court reviews the trial court's decision to grant a new trial for an abuse of discretion. *Id.* at 1372.

As one of its bases for granting a new trial, the trial court focused on the Phillips study, a study generated by Litton's damages expert Dr. Phillips. This study formed the cornerstone of proof on damages for the three interconnected torts. The trial court concluded Dr. Phillips' study was "pure fantasy."

In particular, the trial court focused on the number of assumptions in Dr. Phillips' report. As it noted, had Honeywell not used ion-beaming deposition mirrors:

> (1) Boeing would not have granted Honeywell the November 14, 1985 contract that made Honeywell's inertial navigation systems standard on Boeing aircraft but would instead have given the contract to Litton; (2) Litton would have been able to ramp up to meet the demand of the Boeing contract; (3) the increased volume achieved by Litton would have allowed Litton to overcome the substantial reliability problems of its own systems; and (4) because of the increased reliability achieved by the volume of production facilitated by the Boeing contract, Litton would have forced Honeywell out of the inertial navigation market.

Thus, the trial court was troubled by Litton's claim of causation.

In fact, the trial court reviewed in great detail the evidence on each of these points. It concluded that Litton's proof on causation was skeptical at best. This court agrees with the trial court's determination.

The Phillips study contained a number of highly speculative items. For example, the alleged sales Litton would have made but for Honeywell's infringement were not based on Honeywell's documents showing its actual sales. Instead, Dr. Phillips estimated Honeywell's sales by using public documents to derive the amount of planes delivered every year in the United States. From the number of planes delivered each year he calculated how many ring laser gyros would be needed to equip these planes. He never discusses that some, or many, of these planes may have used the E-beam mirrors.

Dr. Phillips also attempted to account for the sales of spare RLGs to original equipment manufacturers (OEM) systems. He knew Litton's spares amounted to approximately nineteen percent of its OEM sales. Dr. Phillips testified there was little Honeywell information to determine its percentage, but that he was sure it was lower than Litton's. He chose twelve and a half percent as the ratio of spares to OEM sales. This figure, however, is not based on any actual data. Dr. Phillips admitted that he lacked adequate documentation to estimate these figures. Despite having no reliable data, Dr. Phillips still estimated Honeywell's ratio of spares to systems sales. Moreover, he does not provide the court with the method he used in making this estimation.

Finally, in his study, Dr. Phillips estimated the number of replacements of ring laser gyro systems using E-beams during 1982,-'83, '84, '85, and '86. He also predicted that only Litton would have ion-beams to replace these failing systems. However, there is no evidence that these systems would have been replaced with ion-beams, especially during these time periods. In these early years

of the ion-beam system, that system, too, was subject to flaws. In addition, Honeywell did not switch to the ion-beam systems until 1986.

The entire foundation for Litton's purported success as identified in the Phillips' report was little more than inference built upon inference. In the report, Dr. Phillips contends Litton would have had a monopoly in the mirror business and that therefore Litton would have won the McDonnell Douglas, Airbus, and Boeing contracts. However, the beam technology represented only a portion, albeit important, of the navigation RLGs technology. Litton also would have had to substantially increase its production. Litton argued that had it had these contracts it would have had more money, which in turn would have permitted it to step up production to meet these demands.

Dr. Phillips assumed in his damages model that the E-beam was not commercially viable. He admitted that the assumptions he made in his study "are assumptions in the sense that there may be no real world counterpart but they're not assumptions in the sense that they're without considerable thought." He conceded that if "you change the assumption you change the numbers up or down."

Finally, even accepting Dr. Phillips' assumption that E-beams were less reliable, he still proffered no sound economic evidence to show the E-beam was not commercially viable. Some companies might have been willing to buy a less reliable product for less money. Without some accurate assessment of the elasticity of demand in this market, Dr. Phillips' assumptions become more speculative.

Our review of the trial court's decision on this issue is highly deferential. As such, our review reflects a recognition that the trial judge is in the best position to evaluate trial proceedings. The trial judge in this case witnessed the presentation of many weeks of evidence. She

then identified sound reasons to question the weight of the evidence in support of Litton's damage claim and concluded that justice required a new trial on that issue. This court need look no further than the trial court's analysis of the Phillips study to affirm the decision to grant a new trial in this case. Because the Phillips study was predicated on speculation, unrealistic assertions, and formed the basis for all of the damages awarded in this case, the trial court did not abuse its discretion in granting a new trial on damages.

Finally, in this case, the trial court made findings of facts and conclusions of law in an Order dated October 7, 1991, on the issue of intervening rights. The trial court found that the '849 reissue differed substantively from the '958 patent. This court agrees that the claims of the reissue differ substantively from those in the original patent. Thus, Litton may not recover damages for infringement of the '849 reissue which occurred before the reissue date. Therefore, this court affirms the trial court's finding of intervening rights.

CONCLUSION

This court: (1) reverses the trial court and reinstates the jury verdict finding Honeywell intentionally interfered with contractual relations; (2) reverses the trial court and reinstates the jury verdict finding Honeywell intentionally interfered with prospective economic advantage; (3) affirms the trial court's grant of a new trial on damages; (4) affirms the trial court's order finding intervening rights; (5) reverses the trial court's grant of JMOL and reinstates the jury's verdict that the asserted claims of the '849 reissue are not invalid for obviousness; (6) reverses the trial court's finding of inequitable conduct; (7) affirms the trial court's denial of JMOL finding substantial evidence supports the jury's verdict that the hollow cathode process infringes the asserted claims of the '849 reissue; and (8) reverses the trial court's grant

of JMOL and reinstates the jury's verdict finding that the RF ion beam process infringes the asserted claims of the '849 reissue.

COSTS

Each party shall bear its own costs.

AFFIRMED and REVERSED.

BRYSON, Circuit Judge, concurring in part and dissenting in part.

This is a troubling case. The jury found in favor of Litton and against Honeywell on almost every point and returned a huge verdict of $1.2 billion. The district court, in a careful and comprehensive 113-page opinion, overturned the jury's verdict on a number of separate legal grounds, entered judgment for Honeywell, and in the alternative granted Honeywell's motion for a new trial on the issue of damages. There is much force to the district court's analysis, even on those issues on which this court now reverses. The question of obviousness, for example, is close and difficult; the issue of inequitable conduct is also close and reveals a pattern of disturbing conduct by Litton both in the prosecution of the initial patent and in the reissue proceedings; and the jury's verdicts finding infringement with respect to both technologies before it are difficult to accept. Nonetheless, given the restrictive standard of review applicable to a jury's verdict on the issues of obviousness and infringement, I acquiesce, albeit with reservations, in this court's ruling on obviousness and its ruling on infringement with regard to the "hollow cathode" ion-beam source. In light of recent authority holding that inequitable conduct cannot be based on an applicant's non-disclosure of a prior art reference if the examiner independently discovers that reference, *see Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1184-85, 33 USPQ2d 1823, 1832 (Fed.Cir.1995), I also acquiesce in the court's reversal of the district court's ruling on inequitable conduct. In addition, I agree with the court,

this time without reservation, in its affirmance of the district court's order granting Honeywell a new trial on the issue of damages, in its affirmance of the district court's ruling on intervening rights, and in its rejection, without discussion, of Litton's arguments on assignor estoppel and res judicata.

I part company with the court, however, on two points. First, I disagree that Honeywell's RF ion-beam system infringes Litton's reissue patent under the doctrine of equivalents; I would affirm the district court's ruling in Honeywell's favor on that issue. Second, I would affirm the district court's ruling overturning the jury's verdict on the two state law claims, although I would remand for further consideration of the second of the two claims in light of the disposition of the patent issues.

Infringement

The court invokes the doctrine of equivalents to uphold the jury's finding of infringement with respect to the two separate technologies that were used to make mirrors for Honeywell's ring laser gyroscope system: the so-called "hollow cathode" system, and the "RF (Radio Frequency) ion-beam" system. I agree with this court's disposition of the infringement issue as to the "hollow cathode" system, but I disagree with the court's action in upholding the jury's determination that the use of an RF ion-beam system infringes the '849 reissue patent under the doctrine of equivalents.

The RF system generates an ion beam in a very different manner from systems based on a Kaufman-type ion-beam source. Both the specification in the '849 reissue patent and Kaufman himself in testimony at trial described the Kaufman-type ion-beam source in a way that excludes the RF ion-beam source. The expert testimony at trial likewise supported the district court's ruling that, at least as of the time of the original patent, the term "Kaufman-type ion-beam source" referred to a broad-beam ion source

having an anode, a hot wire cathode, permanent bar magnets, and grids.

In such a device, the cathode emits electrons, which are accelerated towards the anode. The magnets force the electrons to spiral in their paths towards the anode. The spiraling electrons strike atoms of argon gas in the chamber and dislodge electrons, creating a stream of positively charged argon ions that are accelerated towards and past the grids.

The RF ion-beam system, by contrast, has no cathode or anode because the system is not a direct current device. The RF system instead consists of a cyclindrical discharge chamber containing an RF oscillating discharge coil. Oscillating RF energy that is radiated from the coil energizes and ionizes the argon gas within the discharge chamber, and the resulting argon ions are then accelerated towards and past the grids.

In addition to being different structurally, the RF system offers significant functional advantages over the Kaufman-type ion-beam source. The record shows that the beam produced by an RF source is "cleaner" than the beam produced by a Kaufman-type source, because the Kaufman cathode can result in contamination of the beam with filament impurities such as tungsten. Moreover, because a silica liner can be placed around the inner walls of an RF system, the argon ions are prevented from colliding with the metal walls of the chamber, thereby avoiding further contamination of the beam.

While the question whether a particular improvement falls within the doctrine of equivalents is ordinarily a factual question for the jury, the jury's finding in this case was infected by its broad construction of the scope of the claims. Because the claims are expressly limited to Kaufman-type ion-beam sources, and because the district court correctly held that the term "Kaufman-type ion beam source," as used in the patent, includes only a source having the four elements set forth in the specifica-

tion, the district court properly asked the question whether, in light of that claim construction, the RF ion-beam source could reasonably be found to be equivalent to the claimed Kaufman-type ion-beam source. And the court properly answered that question in the negative.

The majority acknowledges that Honeywell's RF ion-beam system does not produce ions in the same way as the Kaufman-type ion-beam source. Nonetheless, the majority overturns the district court's ruling on this issue based on its conclusion that the RF ion-beam source produces a broad ion beam similar to the broad ion beam produced by the Kaufman-type ion-beam source, and that experts testified that the RF source and the "Kaufman-type ion beam source" are interchangeable. That analysis, in my view, pushes the doctrine of equivalents too far.

The claim language at issue recites the use of a "Kaufman-type ion beam source." The doctrine of equivalents therefore requires a comparison not of the beam characteristics but of the ion sources that produce those beams. For that reason, the district court properly focused on whether an RF ion-beam source is equivalent to a Kaufman-type ion-beam source, not simply on whether the resulting beam is similar.

To be sure, the RF source performs the same function as the Kaufman-type source, at least at a sufficiently high level of generality. In that sense, the two may be said to be "interchangeable." But the fact that two features serve the same function is only the beginning of the test for legal equivalence. See *Atlanta Motoring Accessories, Inc. v. Saratoga Technologies, Inc.*, 33 F.3d 1362, 1366-67, 31 USPQ2d 1929, 1932-33 (Fed.Cir.1994); *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1457-58, 18 USPQ2d 1842, 1845-46 (Fed.Cir.1991); see generally *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1518, 35 USPQ2d 1641, 1645 (Fed.Cir. 1995), *cert. granted*, —— U.S. ——, 116 S.Ct. 1014, 134 L.Ed.2d 95 (1996). The RF source generates the

ion beam in a way that is quite different from the Kaufman-type source, and the RF source produces significantly improved results as compared to the Kaufman-type source. The two are thus not equivalent under the currently prevailing standard.

What is most troubling about Litton's doctrine of equivalents argument with respect to the RF process is that the limitation of the claims in the reissue patent to Kaufman-type ion-beam sources makes it quite evident that the property rights that the PTO believed should be accorded to Litton were limited to a particular kind of ion-generating system. In reissuance, Litton gave up its original claims, in which it broadly claimed a method based on any "ion beam source." But it has now managed, in effect, to regain the ceded ground through the doctrine of equivalents. Under these circumstances, for the court to hold that Litton is entitled to recover for Honeywell's use of technology that falls well outside the limits of the property rights granted to Litton seems to me improper.

The doctrine of equivalents may well have a proper role to play in patent law, although the debate over that issue will for now have to be carried on at a higher level. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., cert. granted,* —— U.S. ——, 116 S.Ct. 1014, 134 L.Ed.2d 95 (1996). But while the doctrine provides protection against appropriation of the value of some patents, that protection comes at a high cost. Because the doctrine of equivalents adds considerable uncertainty to the question of patent infringement, it introduces a large component of unpredictability into an area of commercial law in which predictability is critical. The Supreme Court has recently commented on the importance of certainty in patent law:

> "[T]he limits of a patent must be known for the protection of the patentee, the encouragement of the

> inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public." Otherwise, a "zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field," and "[t]he public [would] be deprived of rights supposed to belong to it, without being clearly told what it is that limits these rights."

Markman v. Westview Instruments, Inc., —— U.S. ——, ——, 116 S.Ct. 1384, 1396, 134 L.Ed.2d 577 (1996) (citations omitted).

Patent counselors should be able to advise their clients, with some confidence, whether to proceed with a product or process of a particular kind. The consequences of advice that turns out to be incorrect can be devastating, and the costs of uncertainty—unjustified caution or the devotion of vast resources to the sterile enterprise of litigation—can be similarly destructive. An expansive doctrine of equivalents can make counseling clients on infringement an exercise in hedging.

Recent developments have underscored the problem. Infringement claims now routinely come with two components—literal infringement and infringement by equivalents—and the latter is often more significant in counseling and litigation than the former. Moreover, because of the increasing popularity of jury trials in patent infringement cases, the issue of infringement by equivalents is often given to a jury that is unfamiliar with the principles of patent law, unschooled in the pertinent technology, and accorded only modest direction through general, pattern instructions. That setting is fertile ground for arbitrariness, and it has led some to conclude that the doctrine of equivalents, in its current form, has become "a virtually uncontrolled and unreviewable license to juries to find infringement if they so choose." *Hilton Davis*

Chem. Co. v. Warner-Jenkinson Co., 62 F.3d at 1538, 35 USPQ2d at 1662 (Plager, J., dissenting). In part because of patent law, decisions regarding the use and sale of particular technology can have enormous financial consequences—witness this case. For that reason, the law owes it to its constituency to make the lines of potential liability as clear as possible. We should therefore be very cautious about giving broad sweep to a judge-made doctrine that introduces such uncertainty into infringement analysis.

This court's holding that the RF ion-beam system infringes Litton's reissue patent seems to me to present a classic case of unduly broad extension of the doctrine of equivalents. Can we reasonably expect a patent counselor to have confidently advised Honeywell that the RF ion-beam system would infringe Litton's patent? Four judges have now looked at that question; two have concluded that infringement by equivalents cannot reasonably be found, and the other two have concluded that a jury could permissibly find infringement. That diversity of views suggests that the infringement question cannot be answered with the level of confidence that the law ought to provide to lawyers and businessmen facing multi-million dollar decisions. The application of the doctrine of equivalents in a case such as this one thus seems to me to fuel the case against the doctrine, not to support its continued existence within the narrow limits where its purposes are most clearly served and its costs kept to a minimum.

State Law Claims

Although this case was tried principally as a patent infringement action, Litton's brief on appeal places substantial weight on the two state law torts on which the jury found Honeywell liable and as to which the district court granted Honeywell judgment as a matter of law. Litton argues that the two state law torts are independent

of the patent infringement claims, and that the jury's verdicts on the state law claims (separate, non-cumulative verdicts of $1.2 billion in damages on each claim) can stand even if the original and reissue patents are held unenforceable, invalid, or not infringed. I agree with the district court that the verdicts on those counts should be vacated, although I would remand the second state law claim to the district court for further analysis in light of the disposition of the patent issues.

The first of the two state law torts—intentional interference with contractual relations—was based on contracts between Litton and Anthony Louderback, a former Litton employee and one of the inventors on the '958 patent. Shortly after the issuance of the '958 patent, Louderback left Litton and formed his own company, Ojai Research, Inc. In 1981, Louderback and Litton executed a series of agreements under which Louderback agreed to serve as a consultant for Litton for two years and was authorized to use the '958 patent process subject to certain restrictions. The "Technical Assistance and License Agreement," which had a 15-year duration (roughly equal to the remaining life of the '958 patent), prohibited Louderback from using the patented process to make ring laser gyroscope mirrors for anyone but Litton. The "Consulting Services Contract," which was effective for only the two-year period between 1981 and 1983, provided that Litton was to have proprietary rights in improvements and developments made by Louderback "during any work by [Louderback] for Litton," but not in those improvements Louderback made apart from his work for Litton.

The district court held that Litton could not lawfully restrain Louderback from using technology that was in the public domain. Therefore, the court held, the contract provision barring Louderback from using the process claimed in the '958 patent to make mirrors for others would be enforceable only if Litton enjoyed valid patent

rights or other proprietary rights in the process. I agree with the district court's conclusion, but not because the contract is unenforceable under federal law. *See Universal Gym Equip., Inc. v. ERWA Exercise Equip. Ltd.*, 827 F.2d 1542, 4 USPQ2d 1035 (Fed.Cir.1987) (federal law held not to bar a state from enforcing a contract prohibiting the defendant from selling a product that included the plaintiff's "features and designs"). Instead, it is California law that makes the contract unenforceable in the absence of some protected property right of Litton's in the technology that Louderback used to make mirrors for Honeywell.

Because the original patent was surrendered in reissue, and because none of the reissue claims were identical to claims in the original patent, Litton had no valid patent rights in the claimed process either when Louderback entered into the contracts with Litton in 1981 or when he began manufacturing mirrors for Honeywell in 1985. *See* 35 U.S.C. § 252; *Kaufman Co. v. Lantech, Inc.*, 807 F.2d 970, 976, 1 USPQ2d 1202, 1206-07 (Fed.Cir.1986) (absent identity between the original and reissue claims, "the patentee has no rights to enforce before the date of reissue because the original patent was surrendered and is dead"). Nor did Litton prove that, in working for Honeywell, Louderback misappropriated or made unauthorized disclosures of any Litton trade secret or other proprietary information.

At trial, the question of misappropriation centered on Louderback's use of a sliding target that produced mirrors with a graded optical index, or "graded interface" between layers. Louderback testified that he initially set up a coating system at Ojai with a sliding target mechanism, but that he quickly discarded that mechanism and did not begin using it to make mirrors for Honeywell until several years later. He further testified that he regarded the graded index process as his own property, and that he maintained it separately from the

"Litton process system" that he operated under license from Litton.

To support its argument that the sliding target process was Litton's property, Litton characterizes Louderback in its brief as "an exclusive consultant" to Litton between 1981 and 1983. That characterization, however, is not accurate. While the October 1990 settlement agreement between Louderback and Litton referred to their prior consulting relationship as "exclusive," the actual 1981 agreements make it clear that Louderback would be spending only part of his time doing work for Litton.

In order to determine whether Litton obtained any rights in the sliding target process, it is necessary to review the provisions of the Consulting Services Contract. Paragraph 6 of that agreement states:

> Litton shall have all rights . . . in all inventions, developments and discoveries (whether or not patented) which Consultant may conceive or make, or first actually reduce to practice, either solely or jointly with others, during any work by Consultant for Litton whether or not under this agreement and related Purchase Order and which:
>
> (i) relate to subject matter with which Consultant's work for Litton performed in accordance with the Statement of Work set forth in Attachment I; or
>
> (ii) relate to the business, products or demonstrably anticipated research or development projects for Litton, or
>
> (iii) involve the use of time, equipment, materials or facilities of Litton. . . .

The key inquiry under that agreement is whether the sliding target system was developed while Louderback was doing work for Litton and thus belonged to Litton. I agree with the district court that Litton failed to prove that it was.

Both parties recognized that even during the two-year consulting period Louderback would be doing independent work and would be producing optical films for third parties. Under the terms of the consulting agreement, developments made by Louderback while working independently or for third parties did not become Litton's property. Except as summarized above, the record does not reveal the relationship between the sliding target mechanism and Louderback's work for Litton. Because Litton did not prove entitlement to the sliding target technology that Louderback developed, the only right Litton had to that technology under the agreement was a royalty-free, non-exclusive license to its use. Thus, even if the sliding target mechanism was entitled to the status of a trade secret—and there is considerable ground for doubt on that point—it was not shown to be a trade secret that belonged to Litton, rather than to Louderback.

If Litton had no protectible interests in the process that Louderback used in making mirrors for Honeywell, the question is whether the contractual provision barring Louderback from using an ion-beam process to make ring laser gyroscope mirrors for any third party during the term of the 15-year contract was valid and enforceable under California law. That question calls into play section 16600 of the California Business and Professions Code, which states that, subject to statutory exceptions inapplicable here, "every contract by which anyone is restrained from engaging in a lawful profession, trade, or business of any kind is to that extent void."

Section 16600 creates a broad prohibition against "all shades of business restraint, with one narrow judicially-created exception." *Liberty Mutual Ins. Co. v. Arthur J. Gallagher & Co.*, 1994 WL 715613 (N.D.Cal.1994). The exception allows a covenant restraining competition to be enforced "when the subsequent competition constitutes unfair competition, such as the unauthorized use

of trade secrets or confidential information." *Id.* See generally *Muggill v. Reuben H. Donnelley Corp.*, 62 Cal.2d 239, 42 Cal.Rptr. 107, 109, 398 P.2d 147, 149 (1965); *Metro Traffic Control, Inc. v. Shadow Traffc Network*, 22 Cal.App.4th 853, 27 Cal.Rptr.2d 573, 577-78 (1994) (section 16600 bars any attempt to restrict competition by a former employee "unless the restriction is carefully limited and the agreement protects merely a proprietary or property right of the employer recognized as entitled to protection under the general principles of unfair competition").

The prohibition in the "Technical Assistance and License Agreement" is a broad one, as it precludes Louderback for 15 years from using any ion-beam sputtering process to produce optical films for any high power laser application (other than for Litton). Under California law, a covenant not to compete that is that broad is unenforceable absent a showing that it is supported by patent rights or other proprietary interests. Because the district court was clearly correct in its ruling on the intervening rights issue, Litton had no enforceable rights under the original patent. Litton's process was therefore not entitled to patent protection until the reissue date in 1989. Moreover, as noted above, Litton failed to prove that it had any trade secret or other proprietary rights in the process that Louderback used to make mirrors for Honeywell. Accordingly, Louderback did not commit an actionable breach of his contracts with Litton when he began making mirrors for Honeywell in 1985. Honeywell is therefore not liable to Litton for intentional interference with contractual relations.

As for the state claim of intentional interference with prospective economic advantage, a plaintiff alleging that tort "must plead and prove as part of its case-in-chief that the defendant not only knowingly interfered with the plaintiff's expectancy, but engaged in conduct that was wrongful by some legal measure other than the fact

of interference itself." *Della Penna v. Toyota Motor Sales, U.S.A.*, 11 Cal.4th 376, 45 Cal.Rptr.2d 436, 902 P.2d 740 (1995). In this case, the jury stated on its verdict form that Honeywell "did use wrongful means," but as the district court explained, "those words cannot, in and of themselves, substitute for proof of the elements of the tort."

Litton alleged that Honeywell intentionally interfered with Litton's potential economic relations with various aircraft manufacturers who were prospective purchasers of Litton's ring laser gyroscope systems. Specifically, Litton argued that Honeywell induced Louderback to breach his license agreement with Litton and thus obtained Litton's superior ion-beam technology. Through that superior technology, Litton maintained, Honeywell secured contracts with the aircraft manufacturers that Litton would have obtained absent the breach.

Litton, however, has not shown how Honeywell's conduct was legally "wrongful." Because of the "intervening rights" doctrine, Litton enjoyed no patent rights in the process Louderback used when he began making mirrors for Honeywell, and Litton failed to show that Honeywell caused Louderback to breach his licensing agreement with Litton, because Litton did not prove it had other proprietary rights in the process Louderback used to make those mirrors. Moreover, the court does not identify and the record does not reveal any other conduct that would serve as the "wrongful means" required by California law. Because Litton failed to prove that Honeywell used wrongful means to compete for the aircraft manufacturers' business, the district court was correct in overturning the jury's verdict for Litton on the second state law claim as well.

While I disagree with this court's disposition of the two state law issues, I would not affirm the district court's judgment on the second of the two state law claims.

Because the district court found both the original patent and the reissue patent invalid, the court did not find it necessary to address the question whether or how Litton's rights under the reissue patent, which became effective in 1989, might affect Litton's rights under the second state law cause of action. That is an issue that has not been briefed by the parties and as to which we have no guidance from the district court. I would therefore remand that issue for the district court to address in the first instance.

For the reasons stated, I respectfully dissent with regard to the two issues discussed above.

APPENDIX B

[Filed Jan. 6, 1995]

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

Case Nos. CV 90-93 MRP
CV 90-4823 MRP

LITTON SYSTEMS, INC.,
Plaintiff,

v.

HONEYWELL INC.,
a Delaware corporation,
Defendant.

MEMORANDUM OF DECISION

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[Filed Jan. 6, 1995]

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

Case Nos. CV 90-93 MRP
CV 90-4823 MRP

LITTON SYSTEMS, INC.,
Plaintiff,

v.

HONEYWELL INC.,
a Delaware corporation,
Defendant.

MEMORANDUM OF DECISION

Litton Systems, Inc. ("Litton") sued Honeywell Inc. ("Honeywell") for Honeywell's infringement of Litton's reissue patent number 32,849 ("the '849 reissue") which claims a method for fabricating multi-layer optical films. After trial of the issues of validity and infringement, the jury found the patent to be both valid and infringed and awarded Litton $1.2 billion in damages.[1] The issue of Litton's inequitable conduct with respect to the '849 reissue was tried to the Court at the conclusion of the evidence on the issues tried to the jury, and then submitted for decision. Following the jury's verdict, Honeywell

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[1] The jury also found for Litton on its claims for intentional interference with contractual relations and intentional interference with prospective economic advantage and assessed the damages on each of those claims at $1.2 billion.

moved for judgment as a matter of law on all issues and for a new trial.

I.

FACTS

A. *Development of the Claimed Invention*

Litton and Honeywell are the primary manufacturers of inertial navigation systems for commercial aircraft in the United States. In recent years, one of the key components of those systems has been the ring laser gyroscope—a device which uses a laser to detect inertial rotation. A ring laser gyroscope operates by directing two laser beams from the same point, one clockwise and the other counterclockwise around a cavity by means of a series of mirrors. The device is equipped with a photo-detector which monitors the behavior of the beams. Because the beams start from the same location and travel at the same velocity, if the device is not rotating through inertial space, the beams will be reflected around the ring [2] to the starting point at exactly the same time. However, if the device is rotating in inertial space, one of the light beams reaches the photodetector earlier than the other. The difference in arrival time of the two beams can be measured as a change in frequency and, in turn, provides a precise measurement of the rotation of the device. From this measurement, combined with the measurement of an accelerometer, a navigation system can be designed to plot the motion of an aircraft. By using gyroscopes coupled with accelerometers on three separate axes, a navigation system can determine the exact location and heading of the aircraft on which it is placed.

The functioning of a ring laser gyroscope is essentially dependent upon the quality of the mirrors used to direct

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[2] Although the word "ring" may imply that the cavity within which the beams travel is circular, Honeywell's ring laser gyroscopes direct the beams around a triangular cavity and Litton's around a rectangular cavity.

the laser beams. To function in a ring laser gyroscope, a mirror must be approximately 99.99% reflective. In comparison, an ordinary bathroom mirror is only about 90% reflective.

These highly reflective mirrors are manufactured by depositing thin films of alternating layers of high and low index of refraction material on a substrate. Each layer has a thickness of approximately one quarter of a wave length of the light desired to be reflected ("quarter wave layers"). Accordingly, very thin layers, in the range of about one hundred atoms thick, are required for the mirror to function properly. The parties do not dispute that this alternating high and low refractivity quarter wave stack construction was well known in the optical art before the date of the filing of the application for the original patent ("the '958 patent"). The '849 reissue itself notes that quarter wave stacks and their design are explained in detail in the Military Standardization Handbook entitled "Optical Design," which was published in 1962.

During the early 1970s, the standard method for constructing high-quality mirrors was by electron beam evaporation deposition. Electron beam evaporation deposition operates by aiming a beam of electrons at a target material in a vacuum chamber which causes the target material to heat until it evaporates. Some of the evaporated material then collects in a layer on the substrate. By alternating targets with a high and low index of refraction, a mirror can be created on the substrate. Electron beam evaporation deposition is a thermal process which takes place at very high temperatures.

The electron beam method produces a mirror, but the method generally has some disadvantages. The high temperature required for the process to be performed can lead to crystallization and can also cause micro-explosions when the electrons hit impurities or air pockets in the target material, thus transferring impurities to the sub-

strate. Likewise, the electron evaporation technique tends to leave voids between the molecules of the mirror material deposited on the substrate. Also, electron beam evaporation deposition is not an atom-by-atom process and globs of target material can therefore be transferred from the target to the substrate resulting in surface roughness.

Such voids, impurities, crystallization and surface roughness can result in two problems with the operation of the ring laser gyroscope. First, the mirror can become absorptive of the laser light causing decreased beam intensity within the gyroscope. Second, impurities and surface roughness can increase a phenomenon known as "backscatter" in which the beam is not reflected perfectly by the mirror and a portion of the beam turns backwards and combines with the other beam, thereby altering the readings of the measurement device attached to the gyroscope. Therefore, the more amorphous[3] a mirror layer is and the fewer impurities it contains the better it will function as a ring laser gyroscope mirror.

There is no dispute that the problems with electron beam evaporation deposition were well known in the coating art in the early 1970s. Likewise, there is no dispute that it was well known that a more amorphous, less crystalline film, with less surface roughness or impurities would produce a better laser mirror. For example, Thomas Hutchings ("Hutchings"), the head of Litton's mirror program, testified at his deposition that it was obvious to him in 1974 or 1975 that an atom-by-atom deposition technique would yield a better optical film. However, in 1974, films produced by the less expensive electron beam evaporation technique were thought to be good enough for commercial needs. Indeed, when Honeywell was awarded its contract to supply The Boeing Company ("Boeing") with ring laser gyroscope inertial guidance systems

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[3] In this context, an amorphous coating is a coating in which only very small crystals, (less than 150 angstroms) are present.

in 1977, the gyroscopes in those systems employed electron beam mirrors.

Mirrors had also been formed by a method known as radio frequency ("RF") sputtering.[4] RF sputtering employs two plates with argon gas between them. A substrate to be coated is mounted on one plate and a target is mounted on the other. Then an RF discharge between the plates ionizes the gas atoms and causes them to move back and forth between the plates, striking off molecules from the target and depositing them on the substrate. RF sputtering evidences problems with crystallization, surface roughness, and contamination of the substrate by the ionized gas atoms. During the early 1970s, substantial work with respect to RF sputtering was done at a facility known as the Battelle Institute ("Battelle"). Litton investigated the use of the Battelle RF sputtering method to make its ring laser gyroscope mirrors in the early 1970s, but ultimately rejected the method in favor of ion beam sputter deposition.

Litton claims that Honeywell infringed the '849 reissue which claims a method of making mirrors by the ion beam sputter method of deposition. Ion beam sputter deposition operates by projecting a beam of ions through a vacuum to strike a target composed of the material to be deposited. When the ions strike the target, they act like microscopic cue balls, displacing individual atoms or molecules which fly off, or "sputter" from the target. The substrate to be coated is placed in the path of the displaced target atoms and some of the displaced atoms and molecules strike the substrate and adhere to it. In this way a thin coat of target material builds up on the substrate. Ion beam sputter deposition has several advantages over both electron beam evaporation and RF deposition. First, because ion beam sputter deposition is a process which is carried

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[4] This process is not to be confused with the Honeywell radio frequency process which is claimed to infringe the '849 reissue patent.

on at a relatively low temperature, it allows films to be deposited on temperature sensitive materials. Also, ion beam deposition tends to produce more amorphous film with fewer impurities. Although both of these qualities provide substantial benefits in the manufacture of high quality laser mirrors, the ion beam sputter deposition technique is decidedly more expensive and slower than electron beam evaporation or RF sputtering.

Although substantial work had been done in the ion beam sputter field as early as the 1960s, both Litton and Honeywell continued to coat their mirrors by the electron beam evaporation method until the mid-1970s. However, in about 1974, Litton began to experience early failure of its electron beam evaporation coated mirrors, and it started an investigation of other methods of coating mirrors. Around that time, Litton hired David Wei ("Wei"), who had previously been involved with using ion beams to manufacture optical devices, and placed him in charge of improving Litton's mirrors.

Wei reported to Hutchings, who was then the head of Litton's ring laser gyroscope development team. Wei examined a number of different alternatives to electron beam evaporation deposition, including RF deposition, chemical evaporation deposition, and ion beam sputter deposition. As evidenced by a series of internal Litton memoranda, Wei quickly came to the conclusion that ion beam deposition would result in a better mirror. For example, Wei wrote in a 1975 memorandum to Hutchings that his conclusion was supported by substantial work at Bell Telephone Laboratories.

> About five years ago, several research groups in Bell Telephone Laboratories released some exciting information. A well tailored beam of ions has the capability to take off material with such high precision that the machine was given the name "ion mill" or "ion lathe". The other R & D laboratories quickly followed suit. Soon after, the milled-off material was

> found capable of depositing on a substrate with a higher uniformity and a higher speed than conventional sputtering. Moreover, the purity of the deposit turned out to be much higher than the source, thus the process can be used for chemical refinement. Today Bell Labs at Murray Hill alone has about sixty ion beam machines experimenting various thin film and miniatured gadgetry applications. The Bell Labs at other locations is suspected to have just as many ion beam machines. *The applications in optical thin films have been especially rewarding.* Because of its versatility, ion beam patent disclosures are said to be filed as much as fifty a month by Bell Labs.

(Defendant's Exhibit 5236) (emphasis added). Wei's memorandum goes on to conclude that the "[i]on beam machine has been given the highest emphasis since my arrival at Litton *because of its maturity in the R & D field* and also because of its reputation for novel applications by researcher [sic] in optical thin films." *Id.* (emphasis added.)

In response to Wei's memoranda, Hutchings sent Wei to various commercial venders of ion beam sputter deposition equipment in an attempt to produce mirrors using the vendors' equipment. Wei went to Commonwealth Scientific Corporation ("Commonwealth"), Veeco Instruments, Inc. ("Veeco"), Technics Inc. ("Technics"), and Ion Tech, Inc. ("Ion Tech"). Wei asked each of the vendors to deposit optical thin films for him using the vendor's commercial equipment.

Wei testified at trial that the use of ion beam deposition to make ring laser gyroscope mirrors first occurred to him in October 1974 after he received a paper which was given at the American Vacuum Society Convention in Anaheim, California. According to Wei, this paper discussed the application of ion beam technology for the manufacture of microelectronics. In particular, the paper discussed the

use of an ion source which Wei said was known as a Kaufman-type ion source which emitted a broad ion beam.

Veeco and Technics, both commercial vendors of ion beam sputter depositon equipment that used Kaufman type ion sources, had exhibition booths at the Anaheim convention. Wei talked to a representaitve of Veeco named Don Murphy and arranged to have Veeco deposit some sample coatings. In the next month, Veeco provided Wei with two sample glass slides coated with a single layer of titanium dioxide, but the result was opaque,[5] and Wei was dissatisfied with it. Nonetheless, Wei sent two Litton mirror substrates to Dr. W. Laznovsky ("Laznovsky") at Veeco to be coated. Wei testified that Veeco never returned the coated substrates.

At the convention in Anaheim, Wei also talked to Frank Bazzarre ("Bazzarre") of Technics. At Wei's request, Technics deposited cerium oxide on a slide. Wei did not give Technics any instructions as to how to deposit the layer on the slide other than to specify that cerium oxide was to be used. Technics returned the sample in the spring of 1975 and Wei's notes indicate that the sample was highly amorphous but showed a brownish color indicating contamination. After receiving the sample from Technics, Wei traveled to Technics" offices in Alexandria, Virginia. While there, Wei used Technics' equipment to deposit multiple layer films with a high index material of cerium oxide and a low index material of Corning 7059 glass. Although Wei did the actual deposition work, Technics provided the equipment and instruction for its use. Bazzarre demonstrated to Wei the method he had used to make the cerium oxide sample and Wei used that method to deposit the films he made at Technics. Over five days, Wei deposited two mirrors using alternating layers of high and low index of refraction materials. Wei was able to use the equipment easily by referring to an

[5] Wei's notebook reports however, that the Veeco samples became transparent after baking.

operation manual and he did not need to modify the Technics equipment to produce the mirrors.[6]

The mirrors showed very low scatter but were not satisfactory because Wei had not yet determined the proper timing to deposit the layers in a quarter wave thickness. Also, the mirrors had some problems with absorption which Wei attributed to material sputtered from the shutter and walls of Technics' vacuum chamber. Despite the problems evidenced in the mirrors, it is not disputed that Wei succeeded in producing an ion beam deposited mirror in only five days.

In September 1975, Wei also went to Ion Tech, the company with which Dr. Harold Kaufman ("Kaufman"), the inventor of the Kaufman ion source, was associated. Ion Tech provided Wei with a slide coated with tantalum which turned out to have good optical qualities. Wei later traveled to Ion Tech's offices in Colorado where Dr. Paul Reader ("Reader") coated a layer of Corning 7059 glass on Corning 7059 glass. Wei also asked Commonwealth to deposit some glass on glass samples.

Finally, after visiting all of the vendors, and either having the vendors deposit coating for him or depositing coatings himself using the vendor's equipment and instructions, Wei set up an ion beam sputter deposition chamber at Litton. Wei bought the ion beam gun from Ion Tech and bought a variety of vacuum equipment on the recommendation of Paul Schmidt of Bell Laboratories.

In September of 1976, Wei filed an invention disclosure with Litton's patent attorneys. In the disclosure, Wei

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[6] Wei testified that while he was at Technics, an individual named Castellano from Bell Telephone Laboratories visited Technics and instructed Wei on the best angle to maintain between the target and the beam for purposes of deposition. Castellano also sent Wei an article that disclosed the use of a Kaufman-type ion beam source for thin film deposition.

claimed a process for making dielectric mirrors with four features: (1) use of ion beam sputtering as the mirror coating method; (2) use of tantalum pentoxide as the high refractive index material; (3) use of Corning 7059 glass as the low refractive index material; and (4) "special design of oxygen leak finger for oxidation during the coating process." In the application for the '958 patent which was later filed, none of these features were claimed to be novel.

In late 1976, Wei left Litton to work for Xerox Corporation. Not long before Wei's departure, Litton hired Anthony Louderback ("Louderback"), and Louderback assumed Wei's duties after Wei left. At trial Louderback described his role as one of taking Wei's apparatus and refining it to make it usable in a production mode. He testified that during the period between his arrival at Litton and the filing of the patent application on the process, he and others at Litton adjusted the target/substrate/ion gun geometry, and developed flow and pressure parameters, a monitoring system for determining the thickness of the deposited layers, and some associated gas flow hardware. He also testified that during this time, a switch was made for tantalum pentoxide to titanium dioxide as the high index of refraction material.

Louderback remained at Litton until 1981. He was employed by Litton at the time of the prosecution of the original patent. However, he had already left Litton to form his own mirror coating business by the time Litton applied for the '849 reissue.

B. *The Original Patent and its Prosecution History*

Litton filed its original patent application for the claimed invention on April 13, 1978. Wei and Louderback were designated as the inventors, and Litton was the assignee. The patent attorneys appointed to prosecute the original application were Warren C. Porter ("Porter"), Harold E. Gillmann ("Gillmann"), Walter R. Thiel, and

Alfred R. Levine. Initially, Porter was responsible for the prosecution of the patent. As part of the application, Litton submitted no prior art, referring the examiner only to the Military Standardization Handbook's explanation of quarter wave stacks and to Litton's own general discussion of electron beam and RF deposition techniques. The application contained ten claims, only one of which, claim 1, was an independent claim. Claim 1 claimed:

> A method of fabricating multiple layer optical films comprising:
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> bombarding targets obliquely *with an ion beam* to deposit optical film layers on a base whereby molecules of the target materials are sputtered onto the base being coated with said film;
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> performing the deposition of the optical layers inside of a vacuum chamber;
>
> controlling the atmosphere inside of the vacuum chamber to provide sufficient gas to sustain the ion beam and the proper amount of oxygen to accomplish proper stoichiometry of the thin films;
>
> depositing multiple layers of different materials on the base by varying the targets being bombarded by the ion beam.

(Exhibit 5593 at 20) (emphasis added).

On August 9, 1978, the examiner rejected all ten of the claims in the original application as obvious in light of three prior art patents and one article, all of which had been found by the examiner. In response to the examiner's rejection, Litton amended its original claim one to include original claim two which claimed "continuously rotating said base during the deposition of said optical layers."[7] Litton's response was signed by its attorney, Ernest L. Brown ("Brown"). Brown was at that time

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[7] This was not an element of Wei's original invention disclosure.

new to the application and his amendment was accompanied by a power of attorney appointment notice signed by Gillmann.

Brown argued that, "[i]nasmuch as none of the cited patents teaches nor shows the continuously rotating of the base during the deposition of multiple optical layers as claimed in applicants' amended claim 1 and claims dependent therefrom, Claims 1 and 3 through 10 are now believed in condition for allowance. . . ." (Exhibit 5593 at 34). The examiner accepted Brown's argument and allowed the patent subject to one textual change and a change in the drawing. He stated:

> While rotation of the substrate in sputtering processes is known in the prior art, it generally is applied when a mixed coating is to be formed via sputtering simultaneously from two sources of different materials in order to prevent localized deposition and to provide a homogeneous mixture. Generally, rotation of the substrate is not indicated when sputtering from a single target. Accordingly, the presence of such limitation in independent claim 1 is considered to be unobvious.

(Exhibit 5593 at 38). The patent issued on March 6, 1979 ("the '958 patent").

The examiner was incorrect about the novelty of rotation.[8] In fact numerous then existing prior art sources disclosed during the '849 reissue proceedings and in this litigation show rotation of the substrate to obtain a uniform coating in a process that includes only one sputtering source. Moreover, both Wei and Louderback testified at trial that they knew at the time of the application for the '958 patent that rotation of the substrate was old in the art. Likewise, Hutchings testified that he knew that rotation was old in the art in 1978.

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[8] The examiner later reached that conclusion himself during the '849 reissue proceedings. (Exhibit 5594 at 75.)

C. *The Period Between the Original Patent and the Reissue.*

1. Louderback and Ojai Research

In 1981, approximately two years after the '958 patent issued, Louderback left Litton to form his own optical coating company, Ojai Research, Inc. ("Ojai Research"). At that time, Litton, licensed Louderback to use the process claimed by the '958 patent so long as he did not coat mirrors for ring laser gyroscopes or for use with high powered lasers for anyone else but Litton. After some initial difficult[y], Louderback built two ion beam coating chambers at Ojai Research. One was built according to Litton's design and contained some parts originally purchased by Litton for use with its own chambers.

The other chamber Louderback built was constructed differently. The most important difference was that this chamber was equipped with a sliding target mechanism that permitted the deposition of gradient index films.[9] Litton's films have a sharp distinction between the high and low index layers and there is virtually no overlap between the two. Films made on Louderback's second apparatus, rather than distinctly switching between the high and low index layers, gradually shift between the layers and have an area that includes a mixture of high and low index material. Films with this area of mixture between the layers are known as gradient index films because the transition between the materials is gradual rather than sharp. Louderback's apparatus achieved the deposition of gradient index films by sliding a target holder which has the high index target on one side and the low index target on the other so that for a time a portion of both targets was in the beam. Additionally, when using the gradient index process, Louderback never

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[9] There were other distinctions as well, such as the replacement of the metal seals used on Litton's vacuum equipment with rubber seals.

deposited a pure layer of the high index material but always doped that material with a small percentage of the low index material. The mixed layer, or graded interface was approximately ten percent of the thickness of the layers.

Louderback eventually began to sell ring laser gyroscope mirrors to a number of large companies, including Honeywell, using his gradient index process. Louderback did not believe this process to be either infringing or in violation of his license from Litton. Honeywell's first purchase of Louderback's mirrors was in 1984.

2. Honeywell's Capture of the Inertial Navigation Market and Litton's Response.

Prior to the development of the ring laser gyroscope, aircraft navigation systems were constructed using mechanical gyroscopes. During the mechanical gyroscope period, Litton had a significant share of the commercial airline inertial navigation market. However, when the technology shifted to the ring laser gyroscope, Honeywell captured the major share of the commercial market. Honeywell was awarded the contract to supply ring laser gyroscope inertial navigation systems to Boeing in 1977. Since that time Honeywell has entered into contracts to provide inertial navigation systems to Boeing for the 737-300, 757, 767, and 747-400; Airbus for the A-320, A-330, and A-340; McDonnell Douglas for the MD-80 and MD-11; British Aerospace for the BAe 125-1000; Gulfstream for the G-IV; Canadair for the Challenger 601-3A; and Daussault for the Falcon 900. At the time of the initial contract with Boeing in 1977, and for several years thereafter, Honeywell's ring laser gyroscopes used electron beam deposited mirrors.

In 1983 or 1984 Boeing began experiencing early failure problems with the Honeywell systems. Honeywell examined the failed systems and determined that at least some of the failures were caused by degradation of the

mirrors in the ring laser gyroscope. However, the parties dispute whether Honeywell was experiencing a major problem with the performance of the gyroscopes. Litton points to particular Honeywell internal documents that evidence a tone of serious concern with regard to mirror problems. Honeywell responds with data showing that their gyroscopes using electron beam deposited mirrors outperformed Litton's systems using ion beam deposited mirrors.

In any case, in 1985, Honeywell began using ion beam deposited mirrors. As stated, Honeywell ordered its first mirrors from Louderback's company, Ojai Research. Later, Honeywell continued to purchase mirrors from Ojai Research, as well as from Louderback's other company, General Optics, Inc. Honeywell also began to produce its own ion beam sputtered mirrors.

Litton never attempted to enforce the '958 patent, although it knew, as early as June of 1986, that Honeywell and others were using ion beam processors to manufacture ring laser gyroscope mirrors. Moreover, Litton did not assert the '958 patent against Sunstrand Corporation ("Sunstrand") or Allied Signal Corporation although it sued both for infringement of other ring laser gyroscope patents in 1983.[10]

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[10] *Litton Systems, Inc. v. Sunstrand, et al.*, No. CV 83-8420 SVW (C.D. Cal. 1983), *op. denying Litton's Motion for Preliminary Injunction*, 750 F.2d 952 (Fed. Cir. 1984). In *Sunstrand*, Litton asserted ring laser gyroscope patents including a claim for a mechanical mirror mount, a spring for use with a ring laser gyroscope dither mechanism and a dithered rectangular ring laser gyroscope mechanism. The *Sunstrand* case also included allegations arising out of the departure of a group of Litton employees to form a company called Optec, which later was acquired by Sunstrand. Included among the trade secret allegations were claims that the defendants had stolen trade secret information regarding Litton's coating chamber and mirror coating process including "a memorandum dated February 11, 1981, entitled 'Mirror Coating Process' by Anthony Louderback." [*Sunstrand*, Fourth Amended Complaint,

D. *The Reissue Patent and Its Prosecution History*

On July 2, 1985, during the litigation with Sunstrand, Litton applied to have the '958 patent reissued. Litton's application sought a narrowing reissue that added the limitation of original claim two to the reissue's claim one. The limitation in question was that "said multiple layer optical films [comprise] optical layers having different indices of refraction." Litton stated in the reissue declaration that it had claimed more than it had a right to claim in the '958 patent in light of twenty-two prior art references, although it did not specify what the excess it had claimed was.[11]

Litton stated that it first learned of the impact of the cited prior art in August 1984 upon completion of a review of these references by Litton's outside counsel. However, the evidence is uncontroverted that nineteen of the references [12] were brought to Litton's attention substantially earlier in the course of the prosecutions of foreign patent applications. Litton's counsel for the reissue proceedings was Patrick Bright ("Bright") of Kendrick, Netter, & Bennett, and he is the outside counsel who is said to have first discovered the significance of the twenty-two references and recommended to Litton that it seek reissue.

On August 30, 1985, approximately two months after it filed the reissue application, Litton filed a patentability report that cited eighty-two pieces of prior art without

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October 15, 1986, at p. 26.] Allied-Signal agreed to buy ring laser gyroscope technology from Sunstrand after its purchase of Optec. Although Litton's trade secret claims against Sunstrand and Allied-Signal included secrets related to the use of the mirror coating technology claimed by the '958 patent, Litton did not assert infringement of the patent as a ground for relief.

[11] The reissue declaration was signed on behalf of Litton by J. Nathanson, a Litton vice president of finance.

[12] Foreign patents, an article, an abstract and a catalog.

distinguishing which art was more or less material to the claims made in the reissue application. For each of the eighty-two references, Litton provided the examiner with a one or two sentence statement as to why the reference did not teach Litton's invention. Included in the patentability report were references to four pages of Veeco's 1977 product catalog and to a 1978 Commonwealth catalog. These companies were among the vendors that Wei had visited while he was researching ion beam deposited mirrors. Regarding those catalogs, the patentability report stated:

> Applicants had seen catalogs similar to these before original U.S. Patent 4,142,958 issued, but inadvertently did not cite them. They appear to be only of incidental interest because the references considered by the U.S. Patent and Trademark Office before the '958 patent issued are far more material.

(Exhibit 5594 at 41). The 1977 and 1978 catalogs referred to both reveal rotation of the substrate. Likewise, earlier Veeco and Commonwealth catalogs that Litton did not furnish the examiner in the reissue proceeding reveal substrate rotation. The claimed novelty of substrate rotation, of course, was the argument that convinced the examiner to issue the '958 patent.

On October 21, 1985, Sunstrand filed a Protest Under 37 C.F.R. § 1.291 to Litton's reissue application. In its protest, Sunstrand pointed out that Litton had failed to specify the excess in the claims distinctively as required by 37 C.F.R. § 1.175(a)(3). Additionally, the Sunstrand protest cited the examiner to an important 1975 article, entitled "Advances in Low Energy Ion Beam Technology" by W. Laznovsky ("the Laznovsky article"), that Litton had failed to include in its list of references. The Sunstrand protest also highlighted for the examiner several references that Sunstrand felt had been misrepresented or incompletely cited by Litton. Among those references were French Patent 1,422,539, for which Litton provided

an incomplete translation, and a complete version of the 1977 Veeco catalog. Sunstrand pointed out that although Litton had included pages 76-77 and 80-81 of the Veeco catalog in its patentability report, it had omitted pages 78 and 79. Importantly, the omitted pages cite to the Laznovsky article which Litton had failed to bring to the examiner's attention.

On December 9, 1985, the examiner rejected all fourteen remaining claims as obvious in light of five prior art patents and three articles. The Laznovsky article which had been brought to the examiner's attention by Sunstrand was among the group cited by the examiner, as was French Patent Publication 2,129,996 (U.S. equivalent Patent 3,925,187) ("the Bernard patent").

The reasons given by the examiner for his conclusion that the method was obvious were (1) that laser mirrors comprising quarter wave stacks of layers of materials of different indices of refraction were old; (2) Laznovsky teaches the addition of oxygen to the vacuum chamber when depositing oxidic targets; and (3) Bernard teaches that multiple layer coatings comprising different materials sputtered from different targets may be formed by ion beam sputtering. The examiner also specifically reconsidered and rejected his earlier finding regarding the novelty of substrate rotation in light of Laznovsky.

The examiner also rejected the claims because the reissue declaration failed to specify the excess in the claims in relation to each of the prior art references or to point out how the amended claims sought to patentably distinguish over each reference. Additionally, the examiner determined that the reissue declaration failed to specify how the alleged errors occurred and how the "inventors themselves" became aware of the errors, as well as the prior art. The examiner also rejected claims 11 and 14-15 of the application under 35 U.S.C. § 112(1) because the specification was not enabling for those claims.

Bright then had a telephone interview with the examiner, the content of which is not detailed in the prosecution history, and likewise could not be specifically ascertained at trial.[13] After the telephone interview Litton submitted a supplemental declaration which stated that Litton had become aware of the prior art as a result of a consultation between Louderback and Litton's outside counsel, but that Wei had refused to participate.

This supplemental declaration filed by Litton responded to the examiner's obviousness rejection by arguing that neither the Bernard patent nor the Laznovsky article disclosed the atmosphere controlling step or any method for making optical films with alternating layers of materials with different indices of refraction. The declaration then distinguished the remainder of the prior art on the ground that it either did not disclose an ion beam deposition process, did not disclose the atmosphere controlling step or did not explicitly provide for alternating layers of optical film of different indices of refraction. Litton's declaration also distinguished the Bernard patent from the claimed invention on the ground that Bernard utilized a duoplasmatron ion beam source and the claimed invention utilized a Kaufman-type ion beam source.[14]

Litton also submitted a declaration drafted by Bright for Louderback. The Louderback declaration repeated the substance of the Litton declaration, but emphasized the ion beam source distinction between the Bernard patent and the claimed invention. At this same time, Hutchings also submitted a declaration which emphasized the importance of the secondary considerations of long felt need and commercial success citing to *Environmental Designs,*

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[13] At trial, Bright testified that he could not remember the content of the conversation and that he had no documents or notes regarding it.

[14] Laznovsky also discloses the use of a Kaufman type source.

Ltd. v. Union Oil of Cal., 713 F.2d 693, 697, 218 U.S.P.Q. 865, 869 (Fed. Cir. 1983).

In addition to the new declarations, Litton submitted an amendment cancelling claims 11, 14, and 15 and adding new claims 16-29 which were based on the specification of the patent. Along with that amendment, Litton made a series of arguments against the examiner's obviousness rejection, emphasizing the atmosphere controlling step, *the use of a Kaufman-type ion beam source*, and the creation of multiple layer optical films, as well as the secondary considerations involved.

In response to Litton's amendment, the examiner issued a final rejection of all of Litton's claims on July 3, 1986. The examiner rejected the supplemental reissue declaration because it again failed to specify the errors in the '958 patent that Litton claimed as the basis for seeking reissue. In particular, the examiner rejected the declaration because it did not state whether the original claim was invalid under 35 U.S.C. § 102 or 103 or both in view of the cited prior art references. The examiner rejected Litton's new claims 17 and 18 and 25 to 29 on grounds of indefiniteness due to Litton's use of the word "substantially".

Most importantly, the examiner again rejected Litton's claims as obvious in light of Bernard and Laznovsky and rejected all of Litton's new claims on that ground as well. The examiner responded to Litton's arguments against obviousness by pointing out that Litton's arguments attacked the references individually, while the obviousness inquiry is directed to what the references collectively suggest to one possessing skill in the art. The examiner stated:

> In this instance the invention can be made merely by applying knowledge clearly present in the prior art (*In re Sernaker*, 217 U.S.P.Q. 1), because as pointed out previously the prior art of record taught the following to the art:

> (1) The prior art cited by applicants and mentioned in the "Background of the Invention" section of the original patent amply establishes that laser mirrors comprising quarter wave stacks of layers of materials of different refractive indices materials were known prior to the instant invention.
>
> (2) Laznovsky teaches, commencing at page 52 thereof, that ion beam sputtering using a rotating substrate may yield uniform films. Moreover, Laznovsky at page 54 teaches that ion beam sputtering of certain oxidic targets results in loss of oxygen, which must be compensated for by addition of oxygen background gas to the atmosphere inside the vacuum chamber. The features recited in instant claims 3 and 8 are also disclosed by Laznovsky.
>
> (3) French Patent Publication 2,129,996, cited by applicants (U.S. Equivalent is Pat. No. 3,925,187 in the name of Bernard), teaches that multiple layer coatings comprising different materials sputtered from different targets may be formed by ion-beam sputtering (Bernard, Col. 1, lines 38-51; col. 4, lines 1-18).

(Exhibit 5594 at 107). Therefore, the examiner concluded:

> It thus would have been obvious, at the time the invention was made, to fabricate the known multilayer laser mirror stacks using the apparatus and techniques of Laznovsky (including stoichiometry control of deposited films by oxygen addition to the background gas, substrate rotation, pre-sputter cleaning of the targets by ion bombardment, and target cooling), in view of the clear teachings of Bernard pertaining to the use of multi-targeted ion-beam sputtering apparatus for depositing multilayered films of differing composition. Choice of suitable layer ma-

terials of higher and lower refractive index clearly follows from the prior art and does not constitute unobvious modification of the references.

In summary, it is the examiner's position that the invention described by the instant claims merely recites an *obvious* process for making high quality optical film stacks of known structure and function, using a conventional *well known apparatus*, employing procedures and/or precautions necessary for obtaining good quality films of desired optical properties which were well known in the art at the time the invention was made.

Id. at 108-109. The examiner also rejected Litton's Kaufman-type ion source argument on the dual grounds that Kaufman-type ion sources were standard in the art and that in any case the use of a Kaufman-type ion gun was revealed by Laznovsky. The examiner also pointed out that in any event, Litton's claims were not limited to the use of a Kaufman-type ion gun.

On September 9, 1986, Bright again spoke to the examiner by telephone. On this occasion, Bright's partner Frederick Lorig ("Lorig") participated in the call.[15] Also participating in the call was Dr. Phillip Baumeister ("Baumeister"), a technical expert retained by Litton. The examiner's record of the conversation states only that no agreement was reached, and, at the trial, Bright testified that he did not recall the substance of the conversation and he retained no notes of it.

Following this telephone conversation, on December 12, 1986, Litton submitted a new declaration in which it stated that the error that led to the application reissue was that the limitations in original claim two needed to be added to original claim one and that the reason for this error was that neither Litton nor the inventors had

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[15] Lorig is lead trial counsel for Litton in this action.

known of either the Laznovsky article or the Bernard patent. Litton also submitted an amendment to its claims deleting the word "substantially" in response to the examiner's indefiniteness rejection. The remarks attached to the amendment addressed the examiner's obviousness rejection by pointing to three declarations which, according to Litton, clearly demonstrated that the method was not obvious. In the remarks, Litton also argued that there was no need to limit claim one to a Kaufman-type ion source because any person skilled in the art would know that a duoplasmatron could not be used to perform the claimed method in making multiple layer optical films.

The first of the three declarations submitted by Litton was that of Dr. Samuel Lu ("Lu") a former Honeywell employee who had since begun working for Litton. Lu stated that Honeywell had not begun experimenting with ion beam deposition until after Litton had used this method to make mirrors with high reflectance and low back-scatter. Presumably, his declaration was intended to show the secondary consideration of long felt need. Lu did not claim personal knowledge as to the actual cause for Honeywell's experimentation with that process, but rather, his declaration implied that if there had not been a long felt need, Honeywell would not have been compelled to infringe Litton's invention.

The second declaration was signed by Gerald Isaacson ("Isaacson") of Ion Tech. Isaacson stated that Ion Tech does not sell duoplasmatrons and that, to his knowledge, no one had ever used a duoplasmatron to deposit a multiple layer optical film. Isaacson also testified that Litton was, to his knowledge, the first Ion Tech customer to use the Kaufman gun for optical coatings. Isaacson's declaration could have contributed little to the examiner's decision on obviousness, but it did demonstrate that a limitation to exclude duoplasmatrons as a source was required if the '849 reissue were to be allowed.

The third, and most important declaration was signed by Baumeister. Baumeister stated as one skilled in the optical coating art that the claimed process was not obvious because (1) prior to Litton's use of the ion beam sputtering method to make laser mirrors, *no one* had employed this method to make such mirrors; (2) Baumeister himself had never thought of using the ion beam sputtering method; and (3) ion beam sputtered mirrors evidenced high reflectivity and low back scatter, which were surprising results. The Baumeister declaration made the argument that the Laznovsky article did not teach multiple layer coatings and that the Bernard patent failed to teach optical coatings or the use of a Kaufman-type ion beam gun. In essence, what Baumeister told the examiner was that the results of making mirrors by ion beam sputtering were surprising *to him*, that a duoplasmatron would not produce such results because it would be too slow and expensive, and that a Kaufman-type ion source exactly like the ones described by Laznovsky and suggested to Wei by the commercial vendors would be faster and less expensive in producing these results. Baumeister established a long felt need for mirrors deposited by using the ion beam source in the specification rather than a duoplasmatron.[16]

Baumeister convinced the examiner that he had been wrong in his rejection of the application. The next communication in the prosecution history is a record of a telephone conversation between the examiner and Bright. With regard to that conversation, the examiner noted:

> The examiner initiated the interview to inform applicant's attorney that allowance of the application was possible if all the claims were limited to Kaufman

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[16] On the basis of this statement by Baumeister, Litton now *also* claims that those skilled in the art would interpret claim one of the reissue application to refer *only* to an ion beam produced from a Kaufman-type ion beam source because no one would have thought that a duoplasmatron would work.

> gun sources being used in the claimed process. Unless the claims were so limited, the examiner indicated that 35 U.S.C. 112(a) rejection on the basis that applicants were not claiming what they regarded as their invention in view of their argument contained in page 22, no. 15 filed 12/16/86 would be made in the next office action on the merits. The paper #15 overcomes the other previously made objections. Other changes necessary for consistency (if the above proposal is adopted) were discussed. Mr. Bright indicated he would confer with his client and reply in a few days.

(Exhibit 5594 at 205).[17]

Litton subsequently acquiesced in the examiner's position. In a summary record of a telephone call dated March 12, 1987, the examiner reported that "Mr. Bright agreed to cancel claims 16, 18, 21, and 24 and to incorporate a Kaufman ion gun limitation in claim 1. Indefinite terms such as 'substantially' will be deleted from the remaining claims. A supplemental oath concerning the remaining claims will be prepared." A later record of a telephone interview explains that Bright agreed to limit claim 13 to include only Kaufman type ion beam sources in the same manner as claim 1. Litton submitted amended claims and declarations to conform the application to Bright's telephone discussions with the examiner.

Finally, on June 25, 1987, the examiner allowed Litton's claims 1-10, 12-13, 19-20, 20-23, and 25-29. The patent did not issue until January 31, 1989, however, because the patent office pursued an extensive investigation into inequitable conduct by Litton. In the interim period, allowance of the claims was held in abeyance and

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[17] Page 22 of Paper No. 15 is the page on which the Baumeister declaration begins its discussion on obviousness.

Litton was required to respond to a series of inquiries concerning representations and omissions in representations made by it to the patent office. This investigation was eventually abandoned because a change in Patent & Trademark Office ("PTO") procedure eliminated all investigations of inequitable conduct by that office.

The reissue patent contains two independent claims and twenty dependent claims. The two independent claims cover the following:

> 1. A method of fabricating multiple layer optical films, said multiple layer optical films comprising optical layers having different indices of refraction comprising:
>
> > bombarding targets obliquely with an ion beam produced by or derived from a Kaufman-type ion beam source in a vacuum chamber to sputter deposit a plurality of optical film layers on a base;
> >
> > controlling the atmosphere inside the vacuum chamber to provide sufficient gas to sustain the ion beam and the proper amount of oxygen to accomplish proper stoichiometry of the thin films and:
> >
> > depositing multiple layers of different materials on said base by varying the targets being bombarded by the ion beam; and
> >
> > continuously rotating said base during the deposition of said multiple optical layers.

and:

> 18. A method of fabricating multiple layer optical films said multiple layer optical films comprising at least two optical layers having different indices of refraction, in alternating layers, comprising:
>
> > bombarding at least two targets having different indices of refraction obliquely with an ion beam

produced by or derived from a Kaufman type ion beam source in a vacuum chamber to sputter deposit a plurality of optical film layers comprising said material in alternating layers on a base;

controlling the atmosphere inside of the vacuum chamber to provide sufficient gas to sustain the ion beam and the proper amount of oxygen to accomplish proper stoichiometry of the thin films;

depositing multiple layers of said materials having different indices of refraction on said base by varying the targets being bombarded by the ion beam; and

continuously rotating said base during the deposition of said multiple optical layers.

Dependent claim 3 claims the process of claim 1 plus using the ion beam to clean the substrate. Claims 4 through 7, 9 through 12, and 14 through 16 claim the process used to make a mirror with varying amounts of specificity, the most specific being a quarter wave stack RLG mirror with titanium dioxide used as the high index of refraction material and silicon dioxide used as the low index of refraction material. Dependent claim 8 claims the method used in conjunction with a cooling mechanism on the target. Dependent claim 9 claims the method practiced using a low expansion ceramic substrate. Dependent claims 13 and 17 claim the method used to make a mirror controlled so that the mirror contains reduced surface anomalies or impurities and is free of voids. Dependent claims 19 through 22 claim in varying language the use of the process claimed by claim 17 to produce a ring laser gyroscope mirror with reduced surface anomalies and impurities and which is amorphous and free of voids.

E. *Litton's Infringement Action*

Almost immediately after the reissue patent was granted, Litton sued Honeywell and Louderback for infringement of the '849 reissue. Louderback settled the lawsuit in September 1990. As part of the settlement, Louderback agreed to give Litton an option to buy two of Louderback's coating chambers for $750,000. Litton agreed to pay up to $100,000 of Louderback's attorney's fees if Honeywell made claims against Louderback.

As stated, the case against Honeywell resulted in a jury verdict for Litton. Following the verdict, Honeywell filed a Renewed Motion for JMOL [18] and a Motion for a New Trial. This Memorandum of Decision sets forth the rulings on those motions, as well as findings and conclusions on Honeywell's defense that the '849 reissue is unenforceable because it was procured by inequitable conduct.

II.

ANALYSIS

A. *Obviousness*

The ultimate conclusion as to whether a patent claim is obvious under 35 U.S.C. § 103 is a question of law. *Graham v. John Deere*, 383 U.S. 1, 17 (1966); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 857 (1984). However, the resolution of this legal question involves an analysis of the underlying factual issues outlined in *Graham*, which are: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed subject matter and the prior art; and (4) where relevant, objective evidence of non-obviousness such as long-felt need, commercial success, and failure of others. *Graham*, 383 U.S. at 17-18

[18] Honeywell's Motions for Judgment as a Matter of Law filed at the conclusion of the evidence were denied with the exception of the motion relating to intervening rights.

(1966); *Perkin-Elmer Corp.*, 732 F.2d at 894. The findings on these factual issues furnish the foundation for the conclusion as to obviousness of the claimed subject matter as a whole. *Ashland Oil, Inc. v. Delta Resins & Refractories*, 776 F.2d 281, 291 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986).

A patent is presumed valid and the burden of establishing invalidity as to the claims of a patent rests upon the party asserting invalidity. 35 U.S.C. § 282. The presumption of validity is a procedural device which mandates that the party asserting invalidity bear the burden of establishing a prima facie case of obviousness under 35 U.S.C. § 103. *Ashland Oil*, 776 F.2d at 291. Once a prima facie case of obviousness has been established, the patentee must go forward with rebuttal evidence showing nonobviousness. *Id.* at 291-92. The party asserting invalidity, however, always retains the burden of persuasion on this issue and must establish each fact forming the foundation for the ultimate conclusion of obviousness by clear and convincing evidence. *Id.*[19]

Graham, and the Federal Circuit cases that have interpreted it, define the requisite inquiries to be made in an obviousness analysis, although these inquiries do not necessarily mandate issues for a jury. *Structural Rubber Prods. v. Park Rubber Co.*, 749 F.2d 707, 721 (Fed. Cir. 1984). Rather, the evidence in each particular case determines what facts, if any, are actually disputed. *Id.* That the parties are in a heated dispute respecting obviousness is not enough to raise a factual question. *Id.* If there are facts in dispute, however, it is appropriate to submit

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[19] The Court declines to accept Honeywell's invitation to disregard a decade of Federal Circuit precedent and use a preponderance of the evidence standard. However, the Court notes that although the *underlying facts* supporting the obviousness conclusion must be established by clear and convincing evidence, that evidentiary standard does not apply to the ultimate legal conclusion of obviousness itself. *Newell Companies, Inc. v. Kennedy Mfg. Co.*, 864 F.2d 757 (Fed. Cir. 1988), *cert. denied*, 493 U.S. 814 (1989).

the question of obviousness to a jury, so long as the jury is given appropriate instructions. *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1547 (Fed. Cir. 1983). Submission of the question of obviousness to a jury, however, does not preclude the grant of a motion for JMOL. *Newell Companies, Inc. v. Kenney Mfg. Co.*, 864 F.2d 757 (Fed. Cir. 1988), *cert. denied*, 493 U.S. 814 (1989), *citing, Connell*, 722 F.2d at 1550.

A JMOL is proper when the evidence and any inferences therefrom viewed in the light most favorable to the non-moving party permit only one reasonable conclusion as to the verdict. *Sjoland v. Musland*, 847 F.2d 1573, 1576 (Fed. Cir. 1988). In the evaluation of a motion for JMOL, the Court must accept the factual findings to be inferred from a favorable jury verdict so long as they are supported by something more than insubstantial evidence. *Newell*, 864 F.2d at 765. It may not be presumed that the jury found facts on which there is no evidence and the jury may not disregard probative admissions and undisputed facts. *Id.* at 767. Moreover, although the Court must draw all inferences from the facts in favor of the non-moving party, the requirement to draw favorable inferences refers only to factual inferences and not to legal conclusions based on an established set of facts even though all those facts do not favor that conclusion. *Id.*

The Court has assessed Honeywell's motion for JMOL with appropriate regard for the presumption of validity, as well as for the jury's findings on this issue. Having done that, the undisputed facts require that the Court grant Honeywell's motion for JMOL on the issue of obviousness. Each of the four *Graham* factual inquiries leads to the conclusion that the jury's verdict for Litton on this issue was not supported by substantial evidence.

1. The Scope and Content of the Prior Art

The parties dispute the definition of the pertinent prior art for purposes of the obviousness analysis. Litton argues

that the pertinent art should be defined to be almost as narrow as the patent claims themselves. Honeywell, of course, argues for a much broader definition. In this regard, the Supreme Court has held that the pertinent art should be defined with reference to the problem that the inventor is trying to solve. *Graham*, 383 U.S. 1, 35 (in commenting on the *Graham* companion case *Calmar v. Cook Chemical* which involved a spray cap, the Supreme Court said, "[t]he problems confronting Scoggin and the insecticide industry were not insecticide problems, they were mechanical closure problems."). The Federal Circuit has made similar statements. *See Shatterproof Glass v. Libbey-Owens Ford Co.*, 758 F.2d 613, 620 (Fed. Cir. 1985), *cert. dismissed*, 474 U.S. 976 (1985) ("The jury was correctly advised first to look to the nature of the problem confronting the inventor. If the reference is not within the field of the inventor's endeavor, one looks at whether the field of the reference is reasonably pertinent to the problem the inventor is trying to solve.")

The problem that Wei was trying to solve is identified in the patent itself. Wei was seeking to reduce the optical characteristic of back-scatter which is caused by "anomalies and surface roughness in the reflective surfaces of the various layers of the quarter wave stack." (Exhibit 5593 at 5) Wei also was looking for a way to develop a film which was amorphous and free of voids in order to reduce the optical characteristics of both absorption and back-scatter. (Exhibit 5593 at 6) There is no dispute that reduced surface roughness, freedom from voids and an amorphous composition of the film are desirable optical characteristics, but they are not solely pertinent to the field of optics. Rather, these characteristics are also sought by those depositing thin films for use with microelectronics and semiconductor applications. The evidence is clear with respect to this compatibility between the fields. Nearly all of the references used in this case discuss *both* optics and microelectronics. In contrast, there is no evidence that the two fields were self-contained. Wei himself

testified that he first conceived the idea of using ion beam sputter deposition to manufacture ring laser gyroscope mirrors after hearing a presentation on the use of the process in semiconductor applications. The narrowest possible definition of the pertinent art which could reasonably be formulated is the precision thin-film deposition art.

The parties' arguments concerning the scope and definition of the pertinent prior art are in fact largely inconsequential in resolving the issue of obviousness. The two most important prior art references, the Laznovsky article and the Bernard patent, were explicitly admitted by Litton to be prior art during the prosecution of the '849 reissue. Litton stated in its reissue declaration dated December 12, 1986 that its original patent was invalid in light of Laznovsky and Bernard. Such a statement, made in the course of prosecution, constitutes an admission that a reference is prior art for purposes of a later obviousness analysis. *Application of Nomiya,* 509 F.2d 566 (C.C.P.A. 1975). Additionally, the use of quarter wave stacks of alternating high and low index of refraction materials is stated to be old in the art in the patent itself. A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness. *Constant v. Advanced Micro-Devices, Inc.,* 848 F.2d 1560, 1570 (Fed. Cir. 1988), *cert. denied,* 488 U.S. 892 (1988).

Many other references cited by Honeywell and disputed by Litton are clearly within the scope of the prior art even using the narrowest reasonable interpretation. Although a number of these references lend significant weight to the finding of obviousness, the Court confines its analysis to the few that were emphasized as most pertinent by Honeywell. In addition to Bernard and Laznovsky, Honeywell relies primarily upon catalogs issued by the various vendors visited by Wei when he was researching the use of ion beam deposition to make mirrors. That the catalogs are within the proper scope of the prior

art is not disputed and, indeed, these catalogs reveal the very ion beam thin film deposition equipment that was used by Wei. Moreover, Wei has testified that he actually visited these vendors and had them deposit films for him. In the patentability report filed during the reissue proceeding, Litton stated that:

> Applicants had seen catalogs similar to these before original U.S. Patent 4,142,958 issued, but inadvertently did not cite them.

The product catalogs are unquestionably within the scope of the prior art.

Section 103 requires that the obviousness of an invention be determined as of the time the invention was made. 35 U.S.C. § 103. However, the interaction between section 103 and the section 102 statutory bars creates an effective date for prior art pertinent to the obviousness analysis of one year prior to the date on which the application was filed, even if the inventor can show that he invented the claimed subject matter at an earlier date. *Application of Foster*, 343 F.2d 980, 989 (C.C.P.A. 1965), *cert. denied*, 383 U.S. 966 (1966). Litton filed the application for the '958 patent on April 13, 1978. Consequently the critical date for the obviousness analysis is April 13, 1977.

The 1975 "Veeco's Vacuum Products" catalog and the 1975 Technics "Micro Ion Mill" catalog were published prior to the critical date. Litton has made no attempt to demonstrate that these references were not published on the date marked on the publications themselves. Regarding the 1975 "Veeco's Microetch" catalog, the question is less clear. The only date referred to in the document is in the business reply mail portion of the catalog which customers were asked to fill in and return. It contains a box to be checked, followed by the words: "Please send me Veeco's complete Vacuum Products 1975 Catalog." Litton has not tried to call the date of the catalog into

question. Were the date referred to in the document somewhat closer to the critical date, a question of fact might be raised as to whether the "Veeco's Microetch" catalog was published before the critical date. However, because the date referred to in the document is well over one year prior to the critical date, and there is no evidence that the publication was made later, the Court determines that no reasonable jury could conclude that the reference was not published prior to that date. In contrast, a question of fact exists as to whether the catalogs dated 1977 and 1978 were published prior to the critical date. Accordingly, the Court will disregard these catalogs for the purpose of this analysis.

The one reference that remains at issue is an article by J.H. Molitor entitled "Ion Propulsion—Technology Spinoffs" that was published in connection with an American Institute of Astronautics and Aeronautics ("AIAA") International Electric Propulsion Conference held in Florida in November of 1976.[20] The date of this reference is not in dispute. Furthermore, it was available to interested members of the public for copying or republication with permission of the AIAA. Litton's position is that the article is not properly within the scope of the prior art because it was published in connection with a conference designed primarily for "rocket scientists" rather than precision coating specialists. Thus, it is not analogous art. As defined by the Federal Circuit:

> Analogous art is that which is relevant to a consideration of obviousness under section 103. *See In re Sovish*, 769 F.2d. 738, 741, 226 U.S.P.Q. 771, 773 (Fed. Cir. 1985). . . . Two criteria are relevant in determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the art is not within the same field of endeavor, whether it is still reasonably pertinent to the particular prob-

[20] This article (Exh. 5820) was offered in evidence by Litton.

lem to be solved. *In re Clay*, 966 F.2d 656, 658-59, 23 U.S.P.Q. 2d 1058, 1060 (Fed. Cir. 1992) (citations omitted).

Wang Laboratories, Inc. v. Toshiba Corp., 993 F.2d 858, 864 (Fed. Cir. 1993).

The ion beam source at issue here was originally developed for space propulsion and many of the references admitted at trial that discuss the use of the ion beam source for coating also discuss space propulsion. It therefore would be reasonable, and indeed usual, for a person interested in the use of an ion beam source for coating to examine the space propulsion literature. Wei testified that he himself attended several sessions on space propulsion at the Symposium of Ion Sources and Formation of Ion Beams in 1971 at Brookhaven National Laboratory. In fact, Wei had a number of papers issued at AIAA conferences in his possession at the time of the application. Likewise, Hutchings testified that he himself had delivered a paper at an AIAA conference, and read the literature of the AIAA on a regular basis.

Courts tend to take an expansive view of what constitutes analogous prior art. The concept is afforded wide latitude. *E.g., Dann v. Johnston*, 425 U.S. 219, 228-29 (1976) (automatic data processing system for use in business organization analogous to automatic data processing system for use in banks); *Graham*, 383 U.S. at 35 (caps for liquid containers with pouring spouts equivalent to caps for containers with spray caps); *Revlon, Inc. v. Carson Prods. Co.*, 803 F.2d 676, 678 (Fed. Cir. 1986), *cert. denied*, 479 U.S. 1018 (1986) (holding reference to dehairing animal hides analogous to invention relating to human hair treatment); *Weather Eng'g. Corp. of America v. United States*, 614 F.2d 281 (Ct. Cl. 1980) (holding patents relating to airborne delivery and fusing systems analogous to cloud seeding invention).

If the inquiry is focussed not on the field of endeavor, but rather on the problem to be solved, it is apparent that scientists in the space propulsion field commonly interact with those from the precision coating field in seeking solutions to shared problems. What is most compelling, however, is that the relevant portion of the Molitor article does not disclose a related technology from another discipline, but rather suggests, in general terms, the very application claimed by the '849 reissue. The Molitor article, under the heading "Ion Beam Sputtering" describes ion beam sputtering used to create optical mirrors for use with a laser. Far from disclosing an analogous application, Molitor discloses the very application claimed by the '849 reissue, therefore bringing it squarely within the pertinent art for purposes of the analysis of obviousness.

Although there are many more prior art references in the record which are highly pertinent, the references discussed above are sufficient to furnish the basis for this necessarily abbreviated analysis of the issue of obviousness.

2. Level of Ordinary Skill in the Art

A person of ordinary skill in the precision coating art would have at the least a bachelor's degree in the field of physics or engineering and would also have some experience with vacuum deposition technology. In fact, the record suggests that the level of skill in the art is substantially higher, with Ph.D level researchers being more usual. However, for this motion, the Court assumes that the jury chose the lowest reasonable level of skill and will conduct its obviousness analysis on that basis.

3. The Differences Between the Claimed Subject Matter and the Prior Art.

The Court's analysis of the differences between the claimed subject matter and the prior art is made only

with reference to the prior art discussed above. The case for obviousness is too strong to require citation to additional prior art to reinforce it.

a. The Laznovsky Article

This article by Laznovsky was published in the August 1975 issue of Research and Development magazine under the title "Advances in Low Energy Ion Beam Technology." The Laznovsky article reveals the use of a Kaufman-type ion beam source in a vacuum chamber to bombard a target obliquely and sputter deposit optical films, including silicon dioxide and titanium dioxide, on a substrate. Laznovsky also discloses the rotation of the substrate and cooling of the target, as well as cleaning of the substrate in the ion beam prior to deposition.

Moreover, despite Litton's argument that Laznovsky does not disclose the creation of multiple layer films, even a cursory reading of the article demonstrates that it does. The article states "A modification of the fixture shown in fig. six provides a choice of three targets that can be interchanged without opening the bell jar." (Exhibit 5796 at 52).[21] The only conceivable purpose to which the multiple targets could be put is the deposition of a multiple layer film. Although Litton argued at trial that Laznovsky does not teach multiple layer films, it was unable to offer any alternate explanation for Laznovsky's provision of multiple targets. Also, Laznovsky reveals controlling the gas inside the vacuum chamber to provide sufficient gas to sustain the ion beam. Laznovsky likewise suggests that oxygen would have to be added to compensate for oxygen loss when depositing titanium dioxide. This reference teaches that oxygen can be added to the vacuum chamber to ensure proper stoichiometry of the deposited film.

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[21] Figure six is a diagram of the sputtering system described by the article.

Finally, Laznovsky makes the suggestion that ion beam sputtering would provide solutions to the problems faced by Litton in developing its process. The article specifically suggests the ion beam deposition of optical mirrors and states that films of alumina "3000 A thick show no signs of absorption and are of interest as medium index optical coatings." *Id.* at 54. More generally, the article suggests that ion beam sputtering results in reduced contamination of the film, less interference from background gas, a low temperature environment, and better control of film thickness.

The difference between Laznovsky and the claimed method is slim indeed. The only distinction that might be argued is that Laznovsky does not suggest the deposition of a multiple layer optical film comprising layers having different indices of refraction. However, such optical films are admitted to be old in the art. Moreover, any multiple layer film made up of more than one material *necessarily* must be regarded as a multiple layer film with different indices of refraction.[22] The only question then is whether it was obvious in 1978 to apply the Laznovsky method to manufacture the multiple layer optical films claimed by the '849 reissue.

b. The Bernard Patent

The Bernard patent issued in the United States on December 9, 1975 was based on an earlier French patent. The Bernard patent teaches the sputter deposition of multiple layer films, including those used as optical films, onto a rotating substrate by obliquely bombarding a target with an ion beam. The Bernard patent also specifically addresses control of the atmosphere inside the chamber to

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[22] Baumeister quibbled that certain rare earths have the same index of refraction as one another and that theoretically a film could be manufactured of two different materials that have the same index of refraction. However, this statement does not create a *material* issue of fact regarding the issue.

sustain the ion beam and the addition of oxygen into the vacuum chamber to control the stoichiometry of oxides deposited using the method. Bernard also teaches that ion beam deposition can produce a more amorphous film which is free from voids and specifically states that "[i]t is obvious that the manufacturing process by ion sputtering permits eliminating many of the impurities." (Exhibit 5806 at 3:57).

The Bernard patent is distinguishable from the method claimed in the '849 reissue in that it discloses the use of a duoplasmatron rather than a Kaufman-type ion beam source and it limits its specific discussion of the benefits of the process to semiconductor applications.[23]

c. The Product Catalogs

Veeco's 1975 product catalogs disclose bombarding a target obliquely with an ion beam produced by a Kaufman type ion beam source in a vacuum chamber to sputter deposit multiple layer films on a rotating substrate, varying the targets being bombarded by the ion beam, cooling the targets, and adding gas to sustain the ion beam. The catalogs also discuss the use of the Veeco system to deposit various oxides, including titanium dioxide and silicon dioxide and the use of the system to sputter deposit multiple layer optical films. The catalogs further disclose sputter cleaning the substrate prior to deposition.

The distinction between the claimed process and the process disclosed by the Veeco catalogs is that the catalogs do not discuss the introduction of oxygen to assure proper stoichiometry of oxidic films.

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[23] That the Bernard patent, which is aimed at the deposition of semiconductor materials, concerns itself with creating a more amorphous film with less surface roughness and freedom from voids provides additional proof that the semiconductor field and the optical field were seeking the same qualities in their coatings.

The 1975 Technics catalog is not necessary to the Court's analysis of obviousness. Therefore, the Court will not discuss it further except to note that it reveals rotation of the substrate and that Wei had the catalog while he was employed at Litton.

d. The Molitor Article

As stated, the Molitor article specifically suggests that a Kaufman ion beam source can be substituted for a duoplasmatron for use in an ion beam sputter deposition system. The article also states that the ion beam process is useful in the optical component field and discusses the use of ion beam etching for high-powered laser mirrors. Moreover, the Molitor article states that laser mirrors can be built by ion beam sputter deposition and specifies that a 24 layer quarter wave stack using alternating layers of titanium dioxide and silicon dioxide can be deposited using an ion beam system for use as "dielectric mirrors for liquid crystal light valves." Molitor, like Laznovsky, refers the reader to Veeco's system and therefore, by necessity, to the contents of the Veeco catalogs.[24]

Molitor is not a near anticipation of the '849 reissue. Rather, it makes a number of specific suggestions that show that the process revealed by Laznovsky and the Veeco catalogs can be used to create the very product described in the '849 reissue.

4. Secondary Considerations

Evidence rising out of what are referred to as secondary considerations must always, when present, be considered in making the determination of obviousness. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). This is true in every case where obviousness is raised as an issue, not just when the claims remain in doubt after a review of the prior art. *Id.* at 1538-39.

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[24] We always gave them catalogs and instructions.

Although secondary considerations must always figure in the Court's obviousness analysis, a nexus between the merits of the claimed invention and the evidence of secondary considerations is required in order for the evidence to be accorded substantial significance. *Cable Elec. Prods. v. Genmark, Inc.*, 770 F.2d 1015, 1026 (Fed. Cir. 1985). "Thus, the weight to be accorded evidence on secondary considerations is to be carefully appraised in relation to the facts of the actual case in which it is offered." *Id.* Objective evidence of nonobviousness tends to fall into categories such as long felt need, commercial success, failure of others, copying, and unexpected results. *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 857 (1984).

a. Long Felt But Unmet Need

The evidence does not support the conclusion that there was a long felt, but unmet need for an ion beam laser mirror at the time the claimed invention was made.[25] It likewise does not show that at the time of the claimed invention, those in the field were in any way dissatisfied with the performance of the existing electron beam laser mirrors whether used for ring laser gyroscopes or otherwise. In fact, there is substantial evidence to the contrary. Honeywell succeeded in capturing the majority of the commercial market using electron beam mirrors and only later turned to an ion beam process. Baumeister, Litton's own expert, testified:

> No, we didn't seriously consider [making laser mirrors by ion beam sputtering], and the reason was that we were still pushing electron beam evaporation to its limits to see how well you can do with that and we

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[25] That Hutchings was experimenting with ways to make improved laser mirrors does not establish a long felt, but unmet need in 1978.

were still on the learning curve and making very good E-beam evaporative mirrors.

Likewise, the record contains no evidence that the industry had tried and persistently failed to make a better laser mirror prior to Litton's use of the ion beam process. It was the economics involved in the development of the ring laser gyroscope that created the need that existed for a better mirror, not the persistent failure of the methods employed in the prior art. Baumeister's testimony is illuminating:

> Q: Do you believe, Dr. Baumeister, that it is generally accepted in the art of optical scientists that in order to make a good optical film one wishes to avoid the presence of voids?
>
> * * *
>
> A: Again what I am trying to state here is that the whole business is run by the economics, and we were able to ship these mirrors to our parent company down in Palo Alto, California that actually put these lasers together and they lived [sic] to live with the voids in them, if that is what they were, they lived [sic] to live with that and these mirrors had a reasonable amount of scatter with them but still these argon lasers worked fine in that environment there and so to make this general sweeping statement is not very meaningful because I think it begs the economics of it.

(Transcript at 6667:21-68:13). Hutchings, the director of Litton's ring laser gyroscope program, agreed with Baumeister:

> The characteristics of the multilayer thin film technology in the 1974 era according to the coating people was very good, that is, the films did virtually everything they needed at that time.

(Transcript at 454:11-14). Likewise, another of Litton's experts, Dr. Hans Pulker, provided corroborated Hutchings' conclusion:

> Well, I know that a lot of publications were done which recommended sputtering for optical coatings. But it was always the problem of economics. And the problem was always the time. Because most optical products that were produced this way became too expensive. So it's—sputtering is, in my opinion, only useful if the price for this product can bear all these extreme costs you have.

(Transcript at 1109:6-12).

Drawing all of the inferences in favor of Litton, the record does not support a finding of long felt but unmet need. Rather the testimony of Litton's own witnesses supports the contrary inference that the reason that optical scientists had not turned to ion beam sputtering to deposit their mirrors was that they were satisfied with existing technology and saw no particular reason to explore a more expensive alternative. Continued experimentation taken by itself does not require a conclusion of long felt but unmet need.

b. Commercial Success

Although it appears that ion beam mirrors have enjoyed significant commercial success, success is not necessarily probative of nonobviousness. The majority of the commercial success evidence presented by Litton was based on *Honeywell's* use of ion beam mirrors in the ring laser gyroscopes in its already successful inertial guidance systems. There is no showing that Honeywell's systems were commercially unsuccessful until it adopted Litton's process for making ion beam mirrors.

Honeywell achieved dominance in the commercial inertial navigation market *prior* to employing the ion beam process to manufacture its mirrors. Honeywell's superior navigation system, not its superior mirrors, brought about its success. For commercial success of a product embodying a claimed invention to have true relevance in an analy-

sis of nonobviousness, that success must in some way have been due to the nature of the claimed invention, as opposed to other economic and commercial factors unrelated to the technical quality of the patented subject matter. *Cable Elec. Prods.*, 770 F.2d at 1027.

Litton has shown that (i) Litton uses ion beam coated mirrors; (ii) Honeywell adopted the use of ion beam coated mirrors; and (iii) that Litton and Honeywell comprise nearly the entire market for inertial navigation systems. Litton argues that the ineluctable conclusion from those facts is that ion beam coated mirrors are responsible for Litton and Honeywell's market domination. However, those facts prove nothing more than that the parties dominant in the market use ion beam mirrors, not that the use of the mirrors made them dominant.

Litton asked the jury to conclude that Honeywell would have lost its existing market for ring laser gyroscope systems had it not adopted ion beam mirrors. Litton then asked the jury to conclude further that Litton would have taken the market lost by Honeywell, and the jury did so. The difficulty is that the evidence does not support the conclusion that the entire inertial navigation market turns on whether or not ring laser gyroscopes employ ion beam deposited mirrors. Evidence to support a finding of this kind of nexus is wholly lacking.

c. Failure of Others

Litton has not shown that anyone else had repeatedly failed to produce a mirror that would perform satisfactorily in a ring laser gyroscope. There is evidence of continuous experimentation, but there is no evidence of repeated failure. Rather, the evidence is that at the time the Litton process was developed, the industry was having success with the electron beam process. Honeywell's problems with its mirrors occurred long *after* the date of the invention, and they arose because collateral technological advances created a need for better mirrors. At some

point, the quality of the electron beam deposited mirrors was no longer considered sufficient. However, evidence of a need felt by Honeywell long after the '958 patent was granted is only marginally relevant to the issue of obviousness.

d. Copying

Copying is Litton's strongest case, and it was established by Honeywell's own executives. Litton showed that when Honeywell, several years after Litton's invention was developed, determined that better laser mirrors were required, it bought ion beam mirrors from Louderback rather than developing its own process. The jury found copying and, as discussed below, there is substantial evidence to support that finding. However, more than the mere fact of copying by an accused infringer is needed to make these acts significant in a determination of obviousness. *Cable Elec.*, 770 F.2d at 1028. The Federal Circuit has said:

> Rather than supporting a conclusion of obviousness, copying could have occurred out of a general lack of concern for patent property, in which case it weighs neither for nor against the nonobviousness of a specific patent. It may have occurred out of contempt for the specific patent in question, only arguably demonstrating obviousness, or for the ability or willingness of the patentee financially or otherwise to enforce the patent right, which would call for deeper inquiry. Even widespread copying could lead toward opposite conclusions, depending on the attitudes existing toward patent property and the accepted practices in the industry in question. It is simplistic to assert that copying per se should bolster the validity of a patent.

Id. Here, Litton, by seeking reissue, has admitted that its '958 patent was invalid. Additionally, the evidence is overwhelming that the industry as a whole believed the '958 patent to be invalid even prior to Litton's application

for reissue.[26] Nevertheless, it was the evidence of copying that caused the jury to find for Litton on the issue of obviousness, and since there is substantial evidence to support it, this factor should be accorded its due weight.

e. Unexpected Results

Despite Baumeister's declaration, there is no evidence that the claimed method produced unexpected results.[27] Rather, the results of the method claimed in the '849 patent are precisely those predicted or suggested by the prior art. Litton's claim that the results of ion beam sputtering were unexpectedly good is not supported by the record. The prior art is crowded with references showing that ion beam sputtering would lead to a more amorphous film which would be freer of voids and impurities.

5. *The Legal Conclusion Regarding Obviousness*

Enroute to a conclusion with respect to obviousness, a court must not stop until each relevant item of evidence has been fully considered and given its appropriate weight. *Stratoflex*, 713 F.2d at 1539. Particularly relevant is the examiner's original explanation that:

> [i]t . . . would have been obvious, at the time the invention was made, to fabricate the known multilayer laser mirror stacks using the apparatus and techniques of Laznovsky [and the] teachings of Bernard. . . .

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[26] That Litton itself believed the '958 patent to be invalid is evidenced not just by its application for reissue but also by its failure to assert the '958 patent in the *Sunstrand* litigation. Honeywell's belief that the patent was invalid is evidenced by an exhibit heavily relied upon by Litton. Honeywell engineer Richard Rostal wrote in his diary at the time during which Honeywell was negotiating with Louderback, "Litton patent not enforceable." (Exhibit 43 at 3608480).

[27] Litton's exhibit 33 was offered as evidence of praise of the invention, which is also a consideration in the determination of obviousness. *Libbey-Owens-Ford Co. v. BOC Group, Inc.*, 655 F. Supp. 897, 914 (D.N.J. 1987).

> [T]he invention described by the instant claims merely recites an *obvious* process for making high quality optical film stacks of known structure and function, using a conventional *well known apparatus,* employing procedures and/or precautions necessary for obtaining good quality films of desired optical properties which were well known in the art at the time the invention was made.

(Exhibit 5594 at 108-09).

Although the examiner eventually retreated from this position, he did so only in reliance on Paper No. 15 which included the Baumeister declaration. When he did so, the examiner was not aware of a number of uncontroverted facts about the declaration and the circumstances surrounding its execution. He did not know that Baumeister had never used *any kind* of ion beam source to deposit any sort of thin film. Nor was he aware that prior to signing his declaration, Baumeister had read only the specific documents provided to him by Litton's counsel, had done no independent investigation or research, and knew nothing about what the claimed process could achieve other than what was written in the '849 reissue application. Nor did the examiner know that before he signed his declaration, Baumeister had not spoken to the inventors or read the Veeco catalogs. Likewise, the examiner was not aware that Baumeister had done no experiments to provide himself with a reasonable basis for the statements he made about the unexpected results achieved by use of the process. The examiner had complained that he had no data, but the examiner was not aware that Baumeister had none either.

The examiner relied on Baumeister as a person reasonably skilled in the art. Baumeister did not speak as such a person, but rather as an instrument to assert, once again in a more impressive way, the arguments of Litton's counsel. When these same arguments had been made before, the examiner had rejected them. Apparently, he accepted

them from Baumeister because of his academic credentials and his purported skill in the art. In this, he was misled.[28]

Of course, the examiner did not have before him Molitor's article that specifically suggests that ion beam sputter deposition could be used to make laser mirrors and 24-layer quarter wave stack optical mirrors. Nor did the examiner have before him the suggestion in the Molitor article that a Kaufman-type ion source could be substituted for the duoplasmatron. Molitor, although not necessary to complete the already strong case of obviousness established by the Laznovsky article and the Bernard patent, serves to cement the conclusion of obviousness.

The examiner could not have known that Louderback believed, as he testified at trial, that Laznovsky *revealed every element* of claim 1 of the '849 reissue. The examiner did not know that Wei's process was essentially complete after just one visit to Technics. Most significantly, the examiner did not have before him the 1975 product catalogs. Litton did provide him with portions of a 1977 Veeco catalog and a 1978 Commonwealth catalog. However, the examiner might have discounted those references as being published after the critical date, being unaware that the apparatus and the applications of that apparatus that were described in those catalogs were, for the most part, also described in catalogs published well before the critical date.

The process which is claimed in the '849 reissue is nothing more than an obvious application of well-recognized and commercially available technology to manufacture a known product. The Court, construing every disputed fact in Litton's favor and drawing every inference from each of those facts, finds, as a matter of law, that every claim of the '849 reissue is obvious, and that, on this ground alone, Honeywell is entitled to judgment as a matter of law.

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[28] As Litton's own counsel repeatedly remarked at the trial, the reissue patent was granted based on secondary considerations.

B. *Inequitable Conduct*

A patent, by its very nature, is affected with a public interest, and each individual associated with the filing of an application has a duty of candor and good faith in dealing with the PTO. Thus, the inventor, the attorney who prepares or prosecutes the application, and all other individuals who are involved in the substantive preparation or prosecution of the application are subject to this duty. They each have an obligation to disclose to the PTO all information known by them to be material to patentability. 37 C.F.R. § 1.56. Failure to adhere to the duty of disclosure with intent to deceive the examiner constitutes inequitable conduct and if inequitable conduct is found in relation to one or more claims, the entire patent is rendered unenforceable. *Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 874 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1067 (1989).

To prove inequitable conduct, a party challenging a patent must show both that the information not disclosed to the examiner was material to the determination of patentability *and* that there was a failure to disclose with intent to deceive the examiner. *Id.* Materiality and intent are factual issues which the challenger must prove by clear and convincing evidence. *J.P. Stevens & Co., Inc. v. Lex Tex Ltd.*, 747 F.2d 1553, 1562 (Fed. Cir. 1984), *cert. denied*, 474 U.S. 822 (1985). Although materiality and intent are factual issues, because inequitable conduct is an equitable defense, the Court, rather than the jury, is required to resolve disputes regarding these issues. *Paragon Podiatry Lab. v. KLM Lab., Inc.*, 984 F.2d 1182, 1190 (Fed. Cir. 1993).

Once the challenger of a patent establishes both materiality and intent, the Court conducts a balancing test to determine whether the scales tilt to a conclusion that inequitable conduct has occurred. *J.P. Stevens*, 747 F.2d at 1560. Although the challenger has the burden of producing clear and convincing evidence on both materiality

and intent, when the Court weighs the evidence to determine the existence of inequitable conduct, the more material the omission, the less culpable the intent required, and vice versa. *N.V. Akzo v. E.I. Du Pont de Nemours & Co.*, 810 F.2d 1148, 1153 (Fed. Cir. 1987).

1. *The Original Patent*

Honeywell argues that Litton was guilty of inequitable conduct in connection with the '958 patent and that this conduct renders the reissue unenforceable. If inequitable conduct during the prosecution of the original application is found, reissue is not available to obtain new claims to thereby rehabilitate the patent. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 882 F.2d 1556, 1563 n.7 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 1076 (1990); *Application of Clark*, 522 F.2d 623 (C.C.P.A. 1975). Specifically, Honeywell charges that, although Litton obtained issuance of the '958 patent based on the argument that rotation of the substrate was novel, Litton knew at the time that rotation of the substrate was old.

a. Materiality

Information is material if a substantial likelihood exists that a reasonable examiner would consider it important in deciding whether to allow the patent to issue. *Fox Indus., Inc. v. Structural Preservation Systems, Inc.*, 922 F.2d 801, 803 (Fed. Cir. 1990).

Although Litton submitted *no prior art* in connection with its application for the '958 patent, the examiner rejected Litton's original claims on the ground that the prior art discovered by the examiner rendered the patent obvious. To avoid the examiner's obviousness rejection, Litton proposed to limit its independent claim 1 in the following manner:

> and continuously rotating said base during the deposition of said multiple optical layers.

(Exhibit 5593 at 31). In connection with its proposal, Litton argued through its in-house attorney, Ernest L. Brown ("Brown"):

> None of the references teaches nor shows a continuously rotating base during the deposition of the multiple optical layers as described by the applicants and claimed by the applicants in method claim 1 and hence in the dependent claims 3 through 10. . . . Inasmuch as none of the cited patents teaches nor shows the continuously rotating of the base during the deposition of multiple optical layers as claimed in applicants' amended claim 1 and claims dependent therefrom, claims 1 and 3 through 10 are now believed in condition for allowance, and their allowance is respectfully requested.

(Exhibit 5593 at 33-34). The examiner accepted Brown's statement regarding the novelty of substrate rotation and allowed the claims, stating:

> Generally, rotation of a substrate is not indicated when sputtering from a single target. Accordingly, the presence of such limitation in independent claim 1 is considered to be unobvious.

(Exhibit 5593 at 38).

Brown's statement to the examiner was unquestionably false. Since the examiner obviously would have considered any information in Litton's possession regarding substrate rotation important to his decision to allow the patent, materiality is not in doubt.

b. Intent

To prove intent to deceive, Honeywell must show, by clear and convincing evidence, that the involved conduct, viewed in light of all the evidence, including evidence indicative of good faith, was sufficiently culpable to require a finding of intent to deceive. *Kingsdown*, 863 F.2d at 876. Simple negligence, oversight, or erroneous

judgment made in good faith, is never sufficient to show inequitable conduct. *J.P. Stevens & Co.*, 747 F.2d at 1560.

"A party charging inequitable conduct may establish a *prima facie* case by showing an unexplained violation of the duty of candor." *Paragon*, 984 F.2d at 1192. In a responsive denial, the patentee may show facts which demonstrate that, under the particular circumstances as the applicant or his attorney then perceived them, an inference of wrongful intent should not be drawn. *Id.*

The Federal Circuit has inferred intent where the applicant affirmatively submitted misleading information under oath in a situation in which the examiner is unable to investigate the facts. *Paragon*, 984 F.2d at 1191 (granting summary judgment with respect to inequitable conduct). That is precisely what happened here. Litton admitted during the reissue proceeding that it had "seen" product brochures similar to the 1977 Veeco catalog and the 1978 Commonwealth catalog before the '958 patent issued. Those two catalogs, as well as the two 1975 Veeco catalogs, the 1975 Technics catalog, and the 1977 Commonwealth catalog, each disclose rotation of the substrate. Wei testified at trial that he had the 1975 Technics catalog in his possession prior to the time the '849 reissue application was filed. Product brochures such as these are not the sort of information which could be uncovered in the examiner's own search and therefore, Litton's failure to disclose this information to the examiner made it more difficult for him to avoid error in making his decisions. Moreover, because the examiner had no knowledge that Wei had developed the invention by using commercial equipment offered by various vendors, he would not have attached any particular significance to the catalogs.

At trial, both inventors acknowledged that they knew at the time of the prosecution of the '958 patent that rotation of the substrate was old. Wei also testified that

he was in possession of the 1975 Technics catalog that revealed substrate rotation. Hutchings testified that substrates were rotated in coating chambers in 1975 and well before that time. Yet the inventors and Hutchings stood by while Brown convinced the examiner that the '958 patent should be granted based on the novelty of substrate rotation. This evidence is sufficient to establish a prima facie case of intent to mislead the examiner. *Paragon*, 984 F.2d at 1192. Since the materiality of the misleading statement is indisputable, Honeywell made a prima facie case of inequitable conduct. Litton's response is that even if everyone else at Litton knew that substrate rotation was old, Brown did not, and the knowledge of the inventors and Hutchings cannot be imputed to him. Thus, the misrepresentation made by Brown must be viewed as inadvertent.

When the prosecution began, the attorney in charge of the '958 application was Porter. Porter left Litton and was replaced by Brown prior to Litton's submission of its response to the examiner's first rejection of all of the claims. It was Brown who prepared Litton's amendment filed on April 13, 1978, which resulted in the issuance of the '958 patent. Brown's supervising attorney, Gillmann, testified that he had nothing to do with the prosecution of the '958 patent because he was busy with litigation. He also testified that although he generally supervised both Porter and Brown, he did not do so with respect to the '958 application.

Wei testified that he took no part in the prosecution of the '958 application other than signing the inventor's oath and talking with Porter regarding whether Wei's or Louderback's name should be listed first on the patent. Louderback testified that he recalled talking to Porter and Gillmann about the application but did not remember any of their conversations except one in which he was asked to write out a statement of the best mode for the invention. Louderback said that he did not recall reading the application prior to signing the oath and that he

had no recollection of reading the prosecution history. He also did not remember ever talking to Brown. Hutchings testified that he had nothing at all to do with the application or prosecution of the '958 patent.

There is nothing in the record to explain why an obviously false statement was made to the examiner. In essence, Litton's position is that in preparing Litton's response to the examiner's rejection, Brown did not talk to either inventor, the Litton attorney who was supervising him, any Litton technical personnel, or anyone else. Rather, using only the prior art found by the examiner himself, Brown independently fashioned a successful, but innocently mistaken, argument that substrate rotation distinguished the '958 invention from the prior art. This argument that there may have been negligence involved in the representations made to the examiner, even gross negligence, but no intentional deception, is a hard one to accept. The signature of a patent attorney on a paper submitted by him certifies that to the best of his knowledge, information, and belief, there is good ground to support the paper. 37 C.F.R. § 10.18(a). Brown had no knowledge at all, and if one has a duty of candor, to make a statement without any knowledge of whether it is true or false is to make a statement without good ground.[29]

It is not necessary for an applicant or his attorney to make a prior art search or to disclose prior art of which the applicant "should be" aware. *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1362 (Fed. Cir. 1984), *cert. denied*, 469 F.2d 821 (1984). Nonetheless, one should not be able to cultivate ignorance in order to avoid knowledge of well known prior art. *FMC Corp. v. Hennesy Industries, Inc.*, 836 F.2d 521, 526 n. 6 (Fed. Cir. 1987). Before making an argument to

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[29] Litton offered, but the Court did not admit in evidence what Litton said was a dying declaration from Brown in which he stated that he had no intention to mislead the examiner.

the examiner, Brown was obligated to assure himself that he has *some* factual basis for his statement. But, Brown did nothing and spoke to no one, not even the inventors, before making the argument about substrate rotation. Even Litton's own patent law expert, Professor Gambrell testified that:

> Well, they certainly have an obligation to disclose material information, as I described it, that might be useful to the examiner, but the question of how much of an investigation they have to make is a very fuzzy area. *They can't stick their head in the sand and act like they don't want to know something,* but on the other hand, they don't have any obligation to go out and make an investigation.

(Transcript at 3149:9-17) (emphasis added).[30]

Brown appears to have stuck his head in the sand. He was not permitted to do that, and *neither were the inventors.* Litton is a major company with substantial experience and expertise in the prosecution of patent applications. In the words of Litton's President and Chief Executive Officer:

> We're not in banking, we're not in insurance, we're in manufacturing. But if you go down a step further, our business is characterized, some of them, by both of these parameters, some of them by one or the other. But usually high capital investment and high intellectual property, lots of research and development

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[30] Litton argues that Professor Gambrell's testimony regarding the legal duty of a patent attorney practicing before the patent office established facts which Honeywell failed to refute and that therefore Litton's version of the legal standard must prevail. That argument, of course, is completely meritless. A patent law expert, even if allowed to testify by the court, cannot establish propositions of law which the court must accept unless the opposing party refutes them.

> The development time on our product—and I'll just talk here in the Nav Group but it's also true if you go look at our oil services businesses—can be in the tens of millions of dollars. And if you are going to make those kinds of investments, it's absolutely requisite that you protect yourself by having—you know, effectively by having either patent protection or the lead time or the trade secret and intellectual property protection that you get. Otherwise it's impossible to make those kinds of large investments and ever make a return on your investment. So we depend on intellectual property protection in order to run our business.

(Transcript at 4314:13-4315:5).

With respect to a company such as the one described, it is difficult to credit testimony that no one knew anything about the '958 patent except Brown, and that he made an innocent mistake. Nevertheless, since there is arguably some doubt about Brown's intent, the Court will accept Litton's version of the facts and find that the '849 reissue is not unenforceable on the ground of inequitable conduct in the prosecution of the '958 patent.

2. *The '849 Reissue*

In support of its contention that the '849 reissue was procured by inequitable conduct, Honeywell points to a number of specific instances in its prosecution, but does not attempt to tie the instances together to show an overriding pattern of deception. However, in viewing the evidence of Litton's conduct as a whole, the Court has concluded that it does support a finding of intent to deceive the examiner regarding highly material issues.

The identities, if not the roles, of the various Litton counsel and personnel are fairly clear. In June 1983, Litton through Gillman, appointed George Netter, a former partner in the firm of Bright and Lorig, as an

attorney of record for the '958 patent. This appointment was made four years after the '958 patent issued, but two years before the reissue application was filed. Although Netter appears to have been involved in the decision to seek reissue of the '958 patent, Netter testified that he remembered nothing about that subject. Likewise, his role in the reissue cannot be ascertained because all of the parties involved in the reissue testified that they remember nothing about what Netter did. At his deposition, Netter did remember having seen both the 1977 Veeco catalog and the Laznovsky article, but his memory of this failed at the time of trial.

In July 1985, in the reissue proceedings, Netter's partners, Patrick Bright ("Bright") and Elwood Kendrick ("Kendrick") were added as prosecuting attorneys. Bright took charge of the prosecution of the patent from that point forward, although the evidence shows that he was involved as early as 1984.[31] He drafted all the written materials provided to the examiner as a part of the prosecution of the '849 reissue. He also coordinated the production of materials from third parties for use in the prosecution with one notable exception. He had no personal contact with the Litton financial officers who signed the reissue declarations. Gillman, who played no other role in the reissue, procured their signatures.

Honeywell argues that its case of inequitable conduct is established by (1) a misleading statement regarding catalogs similar to the 1977 Veeco catalog and the 1978 Technics brochure in the patentability report; (2) the omission of pages 79 and 80 of the 1977 Veeco catalog from the patentability report; (3) a misleading statement regarding the date upon which Litton became aware of the prior art cited, in the first reissue declaration; (4) Litton's designation of an uninformed financial officer who had

[31] Bright did the prior art review in August 1984 which led to Litton's decision to seek reissue.

absolutely no knowledge of the technology or even of the truth or falsity of the declaration itself to sign the first reissue declaration on its behalf; (5) Litton's submission of 82 prior art references in an indistinguishable mass which were not highlighted or ordered by importance in the "patentability report"; (6) misleading descriptions of the references in the patentability report; (7) concealment of the Laznovsky article; (8) misleading statements in the declaration of David Sadler ("Sadler") filed by Litton in response to the examiner's rejection of Litton's claims as obvious; (8) Sadler's lack of foundation for signing the declaration; (8) misleading statements in the Louderback declaration; and (9) misleading statements in the Baumeister declaration. Although Honeywell's brief argues these allegations somewhat in chronological order, they are best understood if separated into two general categories: procurement of baseless declarations and misrepresentation of prior art.

a. Procurement of Baseless Declarations

Honeywell claims that Litton, with deceptive intent, presented to the examiner four declarations, the content of which was not supported by the knowledge of the declarant. These are, in order of importance, the Baumeister declaration, the Louderback declaration, the first reissue declaration, and a later reissue declaration.

i. The Baumeister Declaration

As stated, the Baumeister declaration was a crucial part of Paper No. 15 which convinced the examiner that the claims of the '849 reissue should be allowed over his prior obviousness rejections. Baumeister's declaration did not present any new facts or arguments to distinguish the invention from the prior art, but rather provided the examiner with the testimony of a man who was represented to be a person of great skill in the pertinent art. Baumeister's testimony at trial proved beyond question that he was not such a person.

Rather, despite his impressive credentials, Baumeister knew nothing about the subject invention other than what Litton's attorneys told him and he had read only the specific documents provided to him by them. Although he spoke with authority on the subject of using duoplasmatrons for optical coating, Baumeister testified at trial that he had never used a duoplasmatron and, in fact, had never used any kind of ion source to deposit an optical coating. Likewise, Baumeister's sole basis for the statements he made regarding the claims in the patent was what he had read in the patent itself. Although Baumeister was profoundly unqualified to make the statements in his declaration, and the arguments he made were identical to those already made by Litton, the examiner reconsidered his prior rejections after considering Baumeister's statements. Baumeister's statements were unquestionably material.

Baumeister's declaration stated:

> I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any document or patent resulting therefrom.

(Exhibit 5594 at 149-50). Baumeister's declaration is not made on information and belief, but rather, purports to be based on his own personal knowledge as one skilled in the art. Because Baumeister had no such knowledge about duoplasmatrons or indeed about any kind of ion beam coating, he could not have known whether any of the

statements that he made were true or not.[32] The declaration sets forth at length Baumeister's learning and skill, omitting to state that Baumeister had no experience with the technology claimed by the patent.[33] This kind of deliberate artfulness supports a finding of an intent to mislead the examiner. *Paragon Podiatry*, 984 F.2d at 1191. Moreover, as in *Paragon Podiatry*, the inference arises not simply from the materiality of the Baumeister declaration, but from the affirmative act of submitting it, its misleading character, and the inability of the examiner to investigate the facts. *Id.*

Litton argues that *Paragon Podiatry* is distinguishable because in that case, the Federal Circuit found inequitable conduct in the misleading omission of information regarding ownership interests in the applicant by experts who artfully suggested in their declarations that they were disinterested. Litton points out that Baumeister had no ownership interest in Litton and had consulted for many other companies including Honeywell. However, it was not the ownership interest held by the declarants in *Paragon Podiatry* that supported the finding of inequitable conduct, but rather, the misleading character of the affidavit itself. In *Paragon Podiatry* the Federal Circuit held the affidavits misleading because "the natural consequence of these acts

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[32] At least one of the statements made by Baumeister without any qualification was in fact not true. He stated, "[i]n 1978, as today, no persons skilled in the methods of forming *multiple layer optical coatings* would use the duoplasmatron for the purposes disclosed in the '958 patent or for any other purpose. ." (Exhibit 5594 at 149). At trial, both Frank Bazzarre and Esther Krikorian testified that they had made multiple layer optical films using duoplasmatrons.

[33] Such an omission would not support a finding of intent to deceive if this were a pioneer patent because, in that case, no one would have used the technology before. Here however, the technology used a commonly available commercial apparatus. The inventors themselves had used such a commercial apparatus in conceiving the invention.

was to lead the examiner to believe that the affiants were disinterested parties, and the patentees were successful in that effort." *Paragon*, 984 F.2d at 1191. Here, the natural consequence of Litton's knowing submission of the Baumeister declaration was to lead the examiner to believe that Baumeister, as one skilled in the art, knew the results which could be obtained from Kaufman-type ion beam sources as opposed to duoplasmatrons.

Such a showing requires that Litton produce *some* evidence that, under the particular circumstances, as Litton's counsel, personnel or employees perceived them, the Court should not draw an inference of wrongful intent. *Paragon*, 984 F.2d at 1192. However, the Court is met with a virtually complete failure of memory and a total lack of documents or notes except those as to which the attorney-client privilege is asserted. As to these priviliged documents or notes, Litton argues that the Court must not draw an inference of intent to deceive from Litton's assertion of the attorney-client privilege because to do so would deny its right to the privilege. Honeywell, in response, argues that the attorney-client privilege is inapplicable. Privilege, however, is not the issue here, and the Court need not decide the validity of Litton's invocation of it.[34] Honeywell established a prima facie case of intent to deceive. Litton has pointed to *nothing* that refutes that showing. In fact, the record is astonishing in its complete lack of evidence as to what transpired between Litton's

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[34] Litton's privilege argument was that because Litton sought the reissue in *contemplation* of asserting the reissued patent in the *Sunstrand* litigation, any communications regarding the reissue were privileged because they would be related to that litigation. Under Litton's argument, documents relating to any reissue application would be unreachable due to attorney-client privilege so long as there is an ongoing case in which the potential reissue patent *might* be asserted. That clearly would be an inequitable result, particularly in a case, such as this one, where the reissue patent never was asserted in the litigation from which the privilege was claimed.

counsel and the examiner in the prosecution of the '849 reissue. The Court is left with no evidence to weigh and no inferences to draw. *See A.B. Dick Co. v. Burroughs Corp.*, 798 F.2d 1392, 1399-400 (Fed. Cir. 1986).

ii. The Louderback Declaration

The Louderback declaration is notable for its unsupported statements regarding duoplasmatrons. Louderback testified at trial that he had little knowledge about the capability of duoplasmatrons. However, because his declaration is formulated not in absolute statements but in terms of likelihoods, the misrepresentations in his declaration do not support a finding that Litton committed inequitable conduct.

iii. The Nathanson and Sadler Declarations

Honeywell points to Litton's designation of two financial officers, neither of whom knew anything at all about the patent or the underlying technology, to sign Litton's reissue declarations. The initial declaration, and several succeeding declarations were signed by a Litton Vice President of Finance named Joel Nathanson ("Nathanson"). Nathanson testified that he played no part in drafting the declaration, made no independent review of the declaration, had no knowledge of the technology, did no investigation, read no documents, did not understand the technical terms used in the claims and specification, in particular the term "Kaufman-type source," and only asked general, non-technical questions of the person who presented the declaration for his signature. Despite signing an oath that all the statements made of his own knowledge are true, Nathanson had *no knowledge whatsoever* regarding whether the material in any of the declarations he signed was true.

The version of 37 C.F.R. § 1.56 which was in effect at the time that Nathanson signed the declaration provided that an application may be stricken from the files for inequitable conduct if a declaration made pursuant to 37

C.F.R. § 1.63 is signed without review thereof by the person making the declaration. 37 C.F.R. § 1.56(c)(2). Section 1.63, in turn, describes the kind of declaration or oath required as part of the application for a patent. Nathanson knew nothing about the declaration he signed. Moreover, even if he had read it, Nathanson had no basis for understanding the statements in the declaration he signed because he had no technical knowledge or experience in this area.

In any case, section 1.63 itself requires that the declaration must state that the person making the declaration "has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration." 37 C.F.R. § 1.63. Nathanson's testimony establishes that, whether or not he read the specification, the claims, or the declaration, he did not understand them.

Bright testified that 37 C.F.R. § 1.64 allows a corporate officer who signs a reissue declaration in lieu of the inventors to do so on information and belief provided by patent counsel. Section 1.64 does indeed allow parties to sign a declaration upon information and belief if the inventor is dead, is insane, or if the inventor refuses to participate in the application and the application is accompanied by proof of the pertinent facts. Section 1.64 does not, however, make any reference to a reissue application prepared by an assignee. In any case, even if Nathanson were permitted to sign based on information and belief, that does not negate the separate requirement of section 1.63 that he understand the contents of the specification and the claims.

A declaration by an informed person gives the examiner the benefit of the participation in the application process of a person with first-hand knowledge of the facts. Without the participation of such a person, the examiner

is left with only patent counsel.[35] To allow the declaration to be signed by a person with no information at all is to make the declaration requirement a meaningless formality. The requirement of 37 C.F.R. § 1.63 that a declarant understand what he is signing is not obviated by the provision of 37 C.F.R. § 1.72 that allows an assignee to sign the oath for a narrowing reissue.

Nathanson's declaration makes a number of unqualified statements, including that "Litton first learned of the impact of [the twenty-two cited prior art references] upon completion, in August 1984, of a review thereof by Litton's outside counsel. . . ." Honeywell argues that this statement is clearly false because twenty of the twenty-two references had been brought to Litton's attention by foreign patent offices between 1979 and 1983. Whether or not the references called to Litton's attention in foreign prosecutions have significance here, the statement does show why it was improper for Litton to designate an uninformed corporate officer to review the application. If Litton had chosen an informed person to sign the application, that person, with knowledge of the foreign prosecutions, would have been required to substitute less deceptive language in the declaration.

In addition to the Nathanson declaration, Litton's June 13, 1986 declaration filed in response to the examiner's obviousness rejection was signed by Sadler, yet another uninformed corporate officer. Sadler testified that he had never spoken with any informed person about the declaration, had never read the patent, had no knowledge of the technology at issue, took no steps to determine whether the statements made in the declaration were true, and read none of the cited prior art. Like the Nathanson declaration, the Sadler declaration makes a number of statements about which Sadler clearly had no knowledge at all.

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[35] Litton's strategy clearly denied the patent examiner any contact with anyone other than Litton's outside patent counsel.

Although the Court finds that the use of Nathanson and Sadler to sign Litton's reissue declarations violates 37 C.F.R. § 1.63, that an applicant violated a PTO rule or a provision of the Manual of Patent Examining Procedure, does not in and of itself amount to inequitable conduct sufficient to render the patent invalid. *See Nintendo of America, Inc. v. Magnavox Co.*, 707 F. Supp. 717 (S.D.N.Y. 1989). The violation must be material and it must have been committed with intent to deceive the examiner. Bright's explanation that he believed that an uninformed officer could sign a declaration on information and belief from the patent attorney must be viewed as credible. Thus, if Litton had done nothing else but use Nathanson and Sadler to sign declarations, a finding of intent to deceive would not be warranted. However, these declarations, when taken together with all the other evidence of mistakes, omissions, studied ignorance and deception, do have significance.

b. Misrepresentation of Prior Art

i. The Footnote about the Product Catalogs

Included in the 82 references cited in the patentability report filed by Litton approximately two months after the inception of the reissue prosecution were references to the 1978 Commonwealth catalog and to parts of the 1977 Veeco catalog. The references to the catalogs were followed by a footnote which stated:

> Applicants had seen catalogs similar to these before original U.S. Patent 4,142,958 issued, but *inadvertently* did not cite them. They appear to be only of *incidental* interest because the references considered by the U.S. Patent and Trademark Office before the '958 patent issued are far more material.

(Exhibit 5594 at 41) (emphasis added). The statement in the footnote is misleading in several respects. First, although the footnote claims that the catalogs "appear to

be only of incidental interest," they each teach rotation of the substrate. Thus, they clearly show that the sole basis for granting the '958 patent was lacking. Moreover, the examiner, unlike Litton's counsel, had no way of knowing that Wei had developed the invention by utilizing the very equipment described in the catalogs, and thus would certainly have found them to be of more than merely "incidental interest." *Id.*

Second, the footnote refers to Litton having seen "catalogs similar to these before original U.S. Patent 4,142,958 issued." *Id.* The testimony at trial is undisputed that Wei had the 1975 Technics catalog while at Litton. Likewise, prior to the issuance of the '958 patent, Hutchings had three Technics catalogs in his possession. Louderback and Hutchings also both testified to having seen Veeco catalogs at Litton, although neither was able to identify which one. While the 1975 Veeco catalogs and the 1975 Technics catalog each reveal rotation of the substrate and are indisputably material prior art, the 1977 catalogs that Litton cited, with the oblique comment regarding "catalogs similar to these," might have been disregarded by the examiner as published after the critical date.

The catalogs, and the unnamed catalogs similar to them that had been in Litton's possession, were highly material references which were, as Litton's counsel well knew, of far more than merely incidental interest. They were among the most material references that could have been furnished to the examiner. Moreover, if Litton had "similar catalogs," a fact of which Litton's counsel was obviously aware because they are said to have been reviewed, they should have been provided to the examiner. The circumstances surrounding this artfully worded footnote in the patentability report lend weight to a finding of deceptive intent.

Bright testified that he did not recall the basis for the statement in the footnote except that he might have discussed the catalogs with Louderback. Likewise, Bright

did not recall whether he had ever asked anyone at Litton whether they had any catalogs older than the ones cited in the patentability report. Bright testified that, although he had never seen the catalogs that had been in Litton's possession at the time of the original prosecution, he could definitely state that they were less material than the art already before the examiner.

He also stated that no one at Litton ever told him that the catalogs had been "inadvertently not cited." The Court is therefore left to wonder why the examiner was told that they were. The footnote must be given some weight in this analysis.

ii. Withholding the Laznovsky article

That the Laznovsky article is a material reference is not in serious dispute; nor is the fact that Laznovsky was cited to the examiner not by Litton, but by Sunstrand. However, Litton argues that failure to cite Laznovsky is not material because Laznovsky was ultimately brought to the examiner's attention and was considered by him before he allowed the reissue patent. Examiner reliance is not an element of inequitable conduct. *Driscoll v. Cebalo,* 731 F.2d 878, 885 (Fed. Cir. 1984). The Federal Circuit has specifically held that it was inequitable conduct for an applicant knowingly to withhold a material reference even though the examiner eventually discovered the withheld reference and rejected certain claims based on the reference. *A.B. Dick v. Burroughs Corp.,* 798 F.2d 1392 (Fed. Cir. 1986).

The question with regard to Laznovsky is whether anyone at Litton knew about the article prior to the time that Sunstrand brought it to the examiner's attention. There is evidence that Litton did have the article. First, at his January 1988 deposition in the Sunstrand case, Louderback stated that he had seen the Laznovsky article either when he was at Litton or before that time. Six months later, in a declaration drafted by Bright for

Louderback, Louderback stated that he had first read the Laznovsky article in May or June 1986, after the Sunstrand protest.[36] At trial, Louderback testified that he could not remember when he had first seen the article.

The record shows that Wei had substantial contact with Veeco, which was Laznovsky's company. In fact, Wei wrote to Laznovsky himself on December, 23, 1974 regarding some substrates he was sending to Veeco for coating. (Exhibit 5226). Wei testified at trial that, although he had written to Laznovsky, he had no idea who Laznovsky was and only wrote the letter on the instructions of Veeco's salesman, Don Murphy.

David Grant, a former manager in Litton's ring laser gyroscope division, testified at his deposition that he had seen the Laznovsky article while he was at Litton. He later changed his testimony. If his deposition testimony is correct, he must have seen the article prior to the filing date of the reissue application because Grant left Litton in October of 1984.

The Laznovsky article was published in the August 1975 issue of R/D magazine. Hutchings testified that although he currently had a subscription to the magazine, he could not remember how long he had had it. He also testified that shortly before this action was filed, most of Litton's magazines were discarded, and he therefore had no way of knowing whether Litton was ever in possession of the issue, and if so, when.

Bright testified that he did not know whether at any time he had tried to determine whether anyone at Litton had ever been in possession of the article. However, Netter testified at his deposition in 1992 that he had seen the Laznovsky article approximately five years earlier in a file in his office.

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[36] Louderback's declaration was filed in response to the Patent and Trademark Office's second request for information in connection with the patent office's internal investigation of Litton's inequitable conduct in connection with the reissue.

In light of the lack of memory on the part of the Litton witnesses, the most persuasive evidence that Litton knew about the Laznovsky article comes from Litton's citation of the 1977 Veeco catalog. In the reissue declaration and thereafter Litton cited only to pages 76 to 77 and 80 to 81 of this catalog. Notably, *on page 79*, the 1977 catalog cites to the Laznovsky article. Litton contends that it never had a complete copy of the 1977 Veeco catalog in its possession, but rather that it only had the four pages it cited to the examiner. The evidence shows otherwise.

Louderback testified that while he was at Litton he saw a Veeco catalog that contained a reference to the Laznovsky article. At his deposition, he testified that it was the 1977 catalog that he had seen. However, at trial he could not identify the precise year of the catalog to which he had referred. What is most telling, however, is that the xerox copy of Litton's original internal French equivalent patent prosecution file shows ghosts of the missing pages on top of the pages that were provided to the French patent office by Litton. (Exhibit 1125). The conclusion is inescapable that Litton had the missing pages, if not the entire catalog, and that by removing the pages, Litton intended to omit the Laznovsky article, which was the single most important piece of prior art which existed. Moreover, in addition to the reference to Laznovsky, the missing pages contain information with respect to both ion beam etching and ion beam deposition using Veeco's apparatus.

The Court must infer from the facts that have been established that Litton knew about the article and its significance both from the form in which the 1977 Veeco catalog was given to the examiner and from the evidence that persons at Litton knew about the article prior to the filing of the reissue application. Bright and Gillmann's testimony that they simply didn't notice that any pages were missing does not avail Litton. The evidence overall

is clear and convincing that Litton knew about the Laznovsky article and intentionally failed to cite it to the examiner. This amounts to a substantial violation of the duty of candor, which by itself could support a finding of inequitable conduct.

iii. Placing the Most Relevant Art Among a Mass of Less Relevant References

Honeywell argues that Litton's submission of the undifferentiated list of eighty-two references in the patentability report rises to the level of inequitable conduct because the examiner was forced to make his way through a sea of marginally important references to find those which were most pertinent. Some cases have held that it was inequitable conduct to bury the most pertinent references within a large list of less pertinent references, particularly if the circumstances are such that the examiner would not carefully examine the art in the list. *e.g. Golden Valley Microwave Foods Inc. v. Weaver Popcorn Co. Inc.*, 24 U.S.P.Q.2d (BNA) 1801, 1827 (N.D. Ind. 1992), *aff'd w'out op.*, 11 F.3d 1072 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 2136 (1994) ("it is . . . a violation of the duty of candor and fair dealing with the Patent Office for an applicant or its attorney to disclose a pertinent prior art patent reference to the examiner in such a way as to 'bury' it or its disclosures in a series of disclosures of less relevant prior art references, so that the examiner would be likely to ignore the entire list and permit the application to issue."); *Penn Yan Boats, Inc. v. Sea Lark Boats, Inc.*, 175 U.S.P.Q. (BNA) 260, 272 (S.D. Fla. 1972), *aff'd* 178 U.S.P.Q. (BNA) 577 (5th Cir. 1973), *cert. denied*, 414 U.S. 874 (1973) (applicant who submitted list citing non-pertinent prior art patents while omitting most pertinent known prior art patent mislead the examiner to an extent sufficient to justify a finding of unenforceability).

Although the list references in the patentability report is long and contains some references that are less

pertinent than others, the Court cannot say that the submission of the list, in itself, supports a finding of inequitable conduct. Bright's argument that he did not wish to mislead the examiner by emphasizing some references at the expense of others that might be interpreted by the examiner or a Court to be more pertinent is persuasive. A patent attorney should be encouraged to err on the side of inclusion, thereby providing as much prior art with an application as possible. There is no evidence that the examiner had any trouble determining which references in the patentability report were the most pertinent.[87] A finding of inequitable conduct is not warranted on this ground.

iv. Misleading Descriptions of the References in the Patentability Report.

Honeywell contends that Litton mislead the examiner by de-emphasizing the pertinence of the references cited in the patentability report. However, the Court must disagree. It is the role of a patent attorney to make arguments for patentability. Of course, a patent attorney may not make arguments that are frivolous or completely unsupported, or which tend to deceive the examiner, but where a reference is distinguished by a plausible argument, the examiner is able to evaluate the arguments made and there is no reason to fault counsel. *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1482 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987) ("The mere fact that Du Pont attempted to distinguish the Blades process from the prior art does not constitute a material omission or misrepresenation. The examiner was free to reach his own conclusion regarding the Blades process based on the art in front of him.").

Whatever their merit, Litton's arguments to distinguish the references furnished to the examiner do not appear to be violations of the duty of candor.

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[87] He was fortunate in having the benefit of the Sunstrand protest however.

c. The Reissue Prosecution as a Whole

The prosecution of the '849 reissue cannot have been just a routine transaction to Litton. Rather, Litton decided to seek reissue of the '958 patent while in the midst of a large ongoing trade secret case which involved the claimed subject matter.[38] Litton itself argues that the application for reissue was prompted by the existence of the Sunstrand litigation. Additionally, at the time Litton decided to seek reissue, Litton knew that Honeywell and others were buying mirrors from Louderback, and this action was brought almost immediately after the reissue was granted. Against a background of these undisputed facts, Litton's story that it retained virtually no notes, documents or records regarding the prosecution of the '849 reissue, and, furthermore, that its witnesses, and its legal counsel in particular, have no recollection of any communications concerning it is difficult to accept. In a company like Litton, this particular reissue prosecution would not have been taken for granted. After all, from Litton's point of view this was a "pioneer" patent. Litton's claim that neither Litton nor its counsel retained any notes or records which are not privileged is placed in doubt by the detailed and specific responses given to the PTO's pointed inquiries concerning inequitable conduct as recently as 1988. These inquiries were directed to what prior art had been known before Litton made particular representations to the PTO, as well as the reasons for the wording of certain representations. Moreover, because there was dissatisfaction with the evasive answers to the first inquiries, the second inquiries were specifically directed to particular individuals. Then, lack of knowledge or failure of memory in answering the inquiries would have put the application in serious jeopardy. Although responses to these inquiries apparently did not satisfy the PTO, they are quite detailed and could hardly have been

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[38] Litton did not assert the '958 patent during that litigation because, no doubt, it knew that it was invalid.

prepared without some memory by someone at Litton of what occurred. By contrast, at trial, the Litton witnesses had little, if any, memory of the prosecution of the '849 reissue. No explanations, excuses or justifications were offered to refute Honeywell's showing.

In sum, the Court concludes that Litton intentionally presented baseless declarations to the PTO, made misrepresentations to the PTO regarding the product catalogs and failed to cite the Laznovsky article to the PTO in the reissue proceeding. These facts, viewed against the background of the original patent proceedings, furnish clear and convincing evidence of inequitable conduct. The '849 reissue is unenforceable.

C. *Infringement*

The jury found that Honeywell infringed the '849 reissue both literally and under the doctrine of equivalents. The jury further found that the infringement was willful. Although the Court concludes that the jury's finding of literal infringement of the '849 reissue is not supported by the evidence, the evidence does support a finding of infringement by Honeywell under the doctrine of equivalents.

The determination of infringement requires a two-step analysis. First, the claims, which define the invention by means of a series of limitations, must be interpreted to determine their proper scope and meaning. Second, the accused device must be compared to the claim language as interpreted. *The Read Corp. v. Portec Inc.*, 970 F.2d 816, 821 (Fed. Cir. 1992).

1. Claim Interpretation

Claim interpretation is a question of law. *North American Vaccine, Inc. v. American Cyanamide Co.*, 7 F.3d 1571, 1574 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 1645 (1994). Nevertheless, where a claim is ambiguous and its interpretation depends on the resolution of subsidiary facts which are genuinely disputed, the resolution

of these facts may be submitted to the jury with proper instructions. *McGill, Inc. v. John Zinc Co.*, 736 F.2d 666, 671-72. If, however, there is no genuine factual dispute which requires resolution in order to interpret the claims, but only arguments of the parties as to what the claims *mean*, interpretation of the claims is a question of law. *Johnson v. Ivac Corp.*, 885 F.2d 1574, 1579-80 (Fed. Cir. 1989). A claim is interpreted in light of the specification, the prosecution history, the prior art and other claims. *Id.* The focus of the inquiry with respect to claim language is on what one skilled in the art would have understood the claim to mean at the time the application containing the claim was originally filed. *E.I. DuPont de Nemours & Co. v. Phillips Petroleum Co.*, 656 F. Supp. 1343, 1380, 138A (D. Del. 1987), *aff'd in part, vacated in part, rev'd in part*, 849 F.2d 143 (Fed. Cir. 1988).

Here, the central claim interpretation dispute is with respect to the meaning of the term "Kaufman-type ion beam source" which is a limitation contained in each of the claims of the '849 reissue. Litton argues that the term means "any broad beam gridded ion beam source," and that the dispute as to its meaning is a factual one to be resolved by the jury. Honeywell's position is that the term means a broad beam ion gun that has (1) a hot wire cathode; (2) an anode; (3) magnets; and (4) grids, and that the meaning of the term is a question of law. In light of the file history of the '849 reissue, there is no ambiguity with respect to the term "Kaufman-type ion beam source," and there is no *genuine* factual dispute concerning its meaning. The interpretation of the term is a question of law, and the Court determines that Honeywell's interpretation is correct.

The language of Claim 1 of the original '958 patent does not describe the source of the ion beam which is used to bombard the target. However, when the meaning of a claim term is in doubt, courts look to the specifica-

tion for guidance. *North American Vaccine* 7 F.3d at 1576. The specification in the '849 reissue is the same as that found in the '958 patent, and it states:

> The ion beam gum [sic] 4 is a commercially available ion omitting [sic] aparatus [sic] *generally known in the art as a Kauffman [sic] type ion beam gun.* The gun's *cathode 6 is a thermonic [sic] emitter, i.e., it emits electrons by passing an electric current through it which heats the wire.* The cathode 6 emits electrons which are accelerated towards the *anode* 8. The electrons being accelerated from the cathode to the anode strike argon atoms and in so doing dislodge electrons from the argon. The results are positively charged argon ions which are accelerated away from the anode and towards the *grids* 12 and 14. *Permanent bar magnets* 10 attached to the anode introduce a magnetic field into the area between the cathode and the anode which cause the electrons traveling towards the anode to spiral. This spiral motion effectively increases the distance which the electrons travel in reaching the anode and thereby increases [sic] number of collisions between electrons and argon atoms. (Emphasis added.)

(Exhibit 5594 at 9) Litton depicted this Kaufman-type ion beam source in Figure 1 of the '958 patent. The written specification and the drawing show that this Kaufman-type ion beam source has: (1) a hot wire cathode; (2) an anode; (3) magnets; and (4) multi-aperture grids. The same claim language, as well as the same specification and drawing of the original '958 patent was used in the '849 reissue.

During the '849 reissue proceedings, in response to the examiner's obviousness rejections, Litton argued that a duoplasmatron, which must indisputably be included within the definition of a source for an "ion beam," could not be used to manufacture the high quality multi-layer optical films described in the '849 reissue application, and

that only a Kaufman-type ion beam gun would produce the unexpected result. The examiner did not accept this argument and remarked that:

> As for applicants' arguments based upon an alleged unexpected result obtained by use of a Kauffmann [sic] type ion gun rather than a duoplasmatron type ion gun, it is noted that most of the claims are not limited to *any particular type of ion gun; thus applicants are arguing a limitation not in the claims.* Moreover, Kauffmann [sic] type ion sources are standard in the art; their use in ion beam sputtering apparatus constitutes nothing unobivous [sic]. See e.g. Lanovsky at page 47, column 1. Lastly, applicants merely allege an unexpected result; *no comparative data are supplied.*[39]

Id. at 109 (emphasis added). As discussed, the '849 reissue was only allowed after Baumeister convinced the examiner that the unexpected result claimed could only be obtained by using a Kaufman-type ion beam gun. In submitting Baumeister's declaration, Litton said:

> The Examiner interprets the claim as including a duoplasmatron which would make the claimed method unworkable. For this reason, Applicants need not add the words "Kaufman gun" or "Kaufman source" to claim 1 because claim 1 cannot properly be construed to refer to any other ion beam gun but the Kaufman gun.

Id. at 131.

In Baumeister's declaration at paragraph 20, he stated unequivocally that:

> Those skilled in the coating arts, in reading claims 1 and 3-10 of this application for reissue, knowing that duoplasmatron sources are unworkable for making

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[39] In paper No. 11, the examiner characterized what Litton was describing as a "conventional well known apparatus."

> multiple layer optical coatings of any kind, let alone the multiple layer optical coatings referred to in claims 1 and 3-10, would reasonably construe these claims to refer not to duoplasmatron sputtering sources, *but only to the Kaufman-type ion-beam guns referred to in the specification of this application.* Reading the claims as referring to a duoplasmatron would not be a reasonable interpretation since one of ordinary skill would know that a duoplasmatron is impractical for making multiple layer optical films.

Id. at 149. There is no doubt that Baumeister's argument convinced the examiner because the claims were then allowed, but *only if* the "Kaufman ion gun limitation in claim 1" was incorporated in every claim. Looking at the file history, it is difficult to argue that the term is in any way ambiguous. The examiner was persuaded to allow the '849 reissue on the condition that Litton amend each of the claims to include a limitation to the Kaufman-type ion beam source in the specification.[40] The source described in the specification was claimed to be the *only* ion beam source that would produce the unexpected result of high reflectivity and low back-scatter, and it was claims limited to this type of ion beam source that were allowed. The Court agrees with Litton that the Kaufman-type ion beam gun in the specification and drawing is gridded and that it produces a broad beam. However, Litton never argued that *any* broad beam gridded ion beam source would produce the unexpected result claimed. Although a duoplasmatron has a narrow beam and a Kaufman-type ion beam gun has a broad beam, there is not a single place in the extensive file history of the '849 reissue where Litton ever uses the term "broad beam gridded ion source," even though, as Honeywell correctly points out, there are references in the file history to

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[40] The declaration was drafted by Litton's patent counsel and then, according to Baumeister, negotiated with him.

a number of other broad beam ion sources. Baumeister argued the result Litton had achieved was possible *only* with the ion beam gun in the specification. He did that because neither he nor Litton knew *what* results could be achieved by the use of any ion beam sources other than duoplasmatrons and the Kaufman-type ion beam gun in the specification. They had no "comparative data."

This is not a case where the Court is limiting the scope of the patent to its preferred embodiment. *Martin v. Barber*, 755 F.2d 1564, 1567 (Fed. Cir. 1985). This is a case in which Litton's patent counsel and its declarants chose the particular words to convince the examiner that the unexpected result obtained by Litton warranted the allowance of the claims.[41] Baumeister represented that the claimed result could not be achieved by the use of a duoplasmatron as contrasted with the result which could be achieved with the Kaufman-type ion beam gun "in the specification." The inventor himself testified that the claims in the '849 reissue were based on the result obtained by the use of the ion beam gun in the specification. If Litton claimed *all* such ion sources, so long as they were broad beam gridded sources, it could have easily said so. However, the examiner might then have wanted to see some comparative data. For excellent reasons, Litton did not claim all such sources, and the mere argument that that is what Litton meant but did not say does not create a doubt or ambiguity concerning the claims' language. "A patent applicant cannot disclose and claim an invention narrowly, and then, in the course of an infringement suit, argue effectively that the claims should be construed to cover that which is neither described nor enabled in the patent." *North American Vaccine*, 7 F.3d at 1577. Litton cannot be permitted to do that here.

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[41] In his declaration, which is part of Paper No. 15, Gerald Isaacson discusses *only* the Ion Tech gun in the specifications.

Although the term "Kaufman-type ion beam source" is not generic in the sense that it includes *any* broad gridded ion source, even with the Court's narrower interpretation, there is substantial evidence to support a finding of infringement by Honeywell. To establish infringement, every limitation in a claim must be found in the accused process exactly or by a substantial equivalent. *Jurgens McKasy*, 927 F.2d 1552, 1560 (Fed. Cir. 1991). Honeywell's processes do not *literally* infringe the '849 reissue, but the jury's finding that Honeywell infringed the '849 reissue under the doctrine of equivalents must be upheld in part.

2. Literal infringement.

Literal infringement requires that, after comparing the accused process with each claim allegedly infringed, each claim limitation in the allegedly infringed process must be present in the accused process. *Hi-Life Products Inc. v. American National Water-Mattress Corp.*, 842 F.2d 323, 325 (Fed. Cir. 1988). The jury was instructed to compare each of the limitations of the allegedly infringed claims of the '849 reissue to the Honeywell processes, and to determine if each of these limitations could be found in the accused processes. The jury was given a set of questions to answer. In answer to Question 2, the jury adopted Litton's interpretation of the term "multiple layer optical films" and found that the term meant "any type of multiple layer optical film including a graded index film structure." In answer to Question 3, the jury adopted Litton's interpretation of the term "continuously rotating said base during the deposition" and found that the term meant "any type of continuous rotation of said base during the deposition, including Honeywell's planetary substrate motion." The interpretation of these claim terms in Questions Nos. 2 and 3 raised factual issues which required resolution. Several sophisticated experts on both sides testified as to the meaning of these two terms as they would be understood by those skilled in the art, and

there is substantial evidence in support of these two findings. On the other hand, the jury was asked in Question 1 whether the term "Kaufman-type ion beam source" meant "Honeywell's definition: "Only that ion beam gun described in the specification section of Litton's patent, which includes any ion beam gun with a hot wire cathode, an anode, magnets, and multi-aperture grids," or Litton's definition: "Any broad-beam, multiapertured, gridded ion beam source, which includes any hollow cathode gun and any radio frequency gun," and it chose Litton's definition, one the Court finds to be in error. Interpreting the term as the Court does, a "Kaufman-type ion beam source," which is a limitation in every claim of the '849 reissue, is not literally found in either Honeywell's process that employs a hollow cathode ion beam source or its process that uses an RF ion beam source. The hollow cathode employed in Honeywell's process does not have a hot wire. Further, as discussed *infra*, the RF ion beam source does not have a cathode of any kind, and does not work in substantially the same way as Litton's process. The evidence does not support the jury's finding that either of these processes literally infringe the claims of the '849 reissue.

3. Infringement under the Doctrine of Equivalents

In addition to finding that the claims of the '849 reissue were literally infringed by Honeywell's processes, the jury found that these processes also infringed the '849 reissue under the doctrine of equivalents. This doctrine is "designed to protect a patentee from an infringer who appropriates the invention but avoids the literal language of the claims . . . ." *Atlas Powder Co. v. E.I. Du Pont De Nemours & Co.*, 750 F.2d 1569, 1579 (Fed. Cir. 1984). To this end, the doctrine permits a finding of infringement when the accused process and the claimed invention are found to "perform substantially the same function in substantially the same way to yield substantially the same result." *Id.* Equivalence is a question of

fact to be determined as of the time the infringement takes place. Therefore, the fact that one skilled in the art would not have known of the equivalent at the time the patent application was filed or the patent was issued is not determinative with respect to the application of the doctrine. *Id.* at 1581. Thus, "changing the patented invention with advances developed subsequent to the patent could infringe under the doctrine of equivalents." *Id.* Although "designing around" the patent does not necessarily require that the patent be saved by invocation of the doctrine of equivalents, the doctrine most often is applied in cases involving mere formal alterations or improvements to the patented process or device. *See, e.g., Standard Havens Prod's, Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360, 1371 (Fed. Cir. 1991), *cert. denied*, 113 S. Ct. 60 (1992); *CMI Co. v. Metropolitan Enters., Inc.*, 534 F.2d 874 (10th Cir. 1976).

The applicable range of equivalents is dependent upon the nature of the invention. The broadest protection under the doctrine of equivalents is reserved for pioneer or generic patents which cover a function never before performed, a wholly novel device, or one of such novelty and importance as to mark a distinct step in an art's progress as distinguished from a mere improvement or perfection of what had gone before. "Liberality is the keynote of construction of a pioneer patent." 3 Rosenberg, *Patent Law Fundamentals*, § 17.07(1) at 17-95 (1994 rev.). However, a patent need not be a pioneer patent to be entitled to a substantial range of equivalents. *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1362 (Fed. Cir. 1983).

In light of the history of the '849 reissue, it cannot seriously be argued that it is a pioneer patent. It is in fact what the examiner continued to say it was until he listened to Baumeister: "an obvious process . . . using a conventional well known apparatus." Therefore, even assuming, as the Court must for this discussion, that

the '849 reissue is valid, this narrow patent cannot be accorded the range of equivalents due a process never before performed or an invention of novelty and importance. However, if it is valid, it should be permitted a range of equivalents commensurate with its significance as an invention unless prosecution history estoppel bars the application of the doctrine of equivalents altogether.

a. Prosecution history estoppel

The doctrine of prosecution history estoppel "precludes a patent holder in an infringement suit from obtaining a construction of a claim that would effectively resurrect subject matter surrendered during the course of proceedings in the Patent and Trademark Office." 4 Chisum, *Patents* § 18.05(1) at 18-153 (1993). The doctrine is most often involved where the applicant has specifically narrowed his claims by amendment or cancellation to avoid prior art rejections by the examiner. Generally, estoppel is not involved when the amendment is designed to remedy a § 112 indefiniteness objection. *See Moeller v. Ionetics, Inc.*, 794 F.2d 653 (Fed. Cir. 1986). However, the line to be drawn between the two types of amendment is not always a clear one. As the court stated in *Loctite Corp. v. Ultraseal, Ltd.*, 781 F.2d 861 (Fed. Cir. 1985):

> *Hughes Aircraft Co. v. U.S.*, 717 F.2d 1351, 1362, 219 USPQ 473, 481 (Fed. Cir. 1983), acknowledged the view of some courts 'that virtually any amendment of the claims creates a "file wrapper estoppel" effective to bar all resort to the doctrine of equivalents.' However, *Hughes* 'reject[ed] that view as a wooden application of estoppel, negating entirely the doctrine of equivalents and limiting determination of the infringement issue to consideration of literal infringement alone.' *Id.* The court concluded:
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> > Amendment of claims is a common practice in prosecution of patent applications. No reason

> or warrant exists for limiting application of the doctrine of equivalents to those comparatively few claims allowed exactly as originally filed and never amended. Amendments may be of different types and may serve different functions. Depending on the nature and purpose of an amendment, it may have a limiting effect within a spectrum ranging from great to small to zero.
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> *Id.* Thus, whenever the doctrine is evoked, 'a close examination must be made as to, not only what was surrendered, but also the reason for such a surrender;' the fact that claims were narrowed 'does not always mean that the doctrine of file history estoppel completely prohibits a patentee from recapturing some of what was originally claimed.' *Bayer Aktiengesellschaft v. Duphar Internat'l Research,* 738 F.2d 1237, 1243, 222 U.S.P.Q. 649, 653 (Fed. Cir. 1984).

Litton argues that the Supplemental Amendment filed on June 2, 1987 which limited all of the claims in the '849 reissue to ion beams "produced or derived from a Kaufman-type ion beam source" was only for the purpose of making explicit what Litton had always viewed as implicit in the claims "in light of the specification." (Exhibit 5594 at 240.) Contending that the amendment did not give rise to an estoppel, Litton points out that the reissue declaration states that the amendment was "necessary to make the claim read with sufficient definiteness to satisfy 35 U.S.C. § 112, second paragraph" as required by the examiner. In response, Honeywell argues that since the file history contains references to many other types of ion beam sources, by amending, Litton limited itself to *only* the ion beam source in the specification. Thus, Litton cannot now claim infringement by a process employing an ion beam source that does not have, as the one in the specification does, a hot wire

cathode, an anode, a magnet and grids. It is Honeywell's position that prosecution history estoppel precludes Litton from attempting to broaden the claims by the application of the doctrine of equivalents to cover Honeywell's hollow cathode or its RF ion source. Although the question is not without some degree of doubt, the Court concludes that Litton is not estopped to claim *some* range of equivalents.

The file history has been discussed. The essential question is whether Litton surrendered anything in amending the claims, and, if so, what? At least the one thing that is certain is that Litton surrendered duoplasmatron sources to secure the allowance of its claims. Prior to the filing of Paper No. 15 and the conversations with Litton's counsel and Baumeister that followed its submission, the examiner had concluded that the claims should be rejected as obvious. Paper No. 15 and the conversations that followed its filing overcame the examiner's § 103 rejection by convincing him that duoplasmatron sources could not achieve the unexpected result obtained by the use of the Kaufman-type ion beam source described in the specifications.[42] Therefore, the examiner agreed to allow the claims if they were amended to make clear that not *all* ion beam sources were claimed, but only the Kaufman-type ion beam source. Litton contends that it is clear from the reissue declaration that the amendment was only to make explicit what was always implicit, and that if the examiner didn't agree, he could have said so. However, the amendment was not only to satisfy § 112(2)—if Litton had not agreed to limit the claims to the Kaufman-type ion source, the prior rejection, based on obviousness, would have been made final. Honeywell is correct that the examiner had before him references to many other ion beam sources,[43] but the file

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[42] Duoplasmatrons would be too slow and expensive.

[43] As Honeywell points out, the prior art references describe not only narrow beam duoplasmatrons, but also broad beam duoplasma-

history does not indicate that these other sources were ever the subject of discussion with the examiner—only duoplasmatron ion beam sources and the ion beam source in the specification were specifically mentioned by the examiner in making his determination. Baumeister's argument was based on the distinction to be drawn between only these two sources. Thus, although Litton might now be estopped to claim duoplasmatron sources, placing the examiner's actions in context, it is arguable that Litton should not be estopped to claim some other ion beam sources as equivalents. As stated, Honeywell's view is that Litton is estopped to claim *any* range of equivalents, and Litton's view is that there is no estoppel at all. In light of the substantive narrowing of the claims, there is no merit in Litton's position. Moreover, whatever the merit in Honeywell's position may be, the Court finds it unnecessary to determine the precise scope of the estoppel in order to resolve the infringement issues now before the Court.[44]

b. Application of the doctrine of equivalents

The finding of infringement by Honeywell's hollow cathode process is supported by substantial evidence even accepting the Court's narrow interpretation of the term "Kaufman-type ion beam source." Without resort to the doctrine of equivalents, the hollow cathode source is a "Kaufman-type source" despite its lack of a hot wire. Applying the doctrine of equivalents, Honeywell's hollow cathode ion beam source performs substantially the same function as the Kaufman-type ion-beam source in the

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trons. The references also include gridded broad beam Finkelstein sources, inductively coupled radio frequency guns, colutron guns and the guns described in the Harper chapter attached to Baumeister's declaration submitted to the examiner as part of Paper No. 15.

[44] The change from any source for "an ion beam" to a "Kaufman-type source" for an ion beam was clearly a substantive one, and the original claim is *not* identical to the amended claim.

specification of the '849 reissue, and it does so in substantially the same way even though it does not have a hot wire cathode. Also, it yields substantially the same result. From the testimony, the hollow cathode ion beam source is in fact merely a modification or improvement of the Kaufman-type ion beam gun in the specification. It improves the operation of the process in that it substantially alleviates the maintenance problems involved in the use of the hot wire. Thus, this source is either within the meaning of "Kaufman-type source" as used in the claims, or within the narrowest range of equivalents which must be accorded the '849 reissue. Thus, Honeywell's hollow cathode process infringes the '849 reissue. On the other hand, substantial evidence does not support the jury's finding of infringement under the doctrine of equivalents with respect to Honeywell's process which employs an RF ion beam source.

The Kaufman-type ion beam source, having as its principal elements a hot wire cathode, an anode, magnets and grids, is described in the specification quoted above. Honeywell's RF ion beam source [45] consists of a cylindrical insulating discharge chamber around which is coiled an RF oscillating discharge coil. A type of gas is introduced into the discharge chamber as the source material for the ions. The oscillating RF energy that is radiated from the coil propagates RF energy within the discharge chamber, thereby energizing the electrons and ionizing the gas therein. The ions are then accelerated and extracted from the chamber by multi-aperture grids. As can be seen from the description, this source does not have a cathode at all. There is no electron emitting element inside the discharge chamber. Rather, electrons are excited inside the discharge chamber and ions thereby produced by induction from the RF oscillating coil that encircles the insulating wall of the chambers. Clearly,

[45] These sources date from the 1960s.

the RF ion beam source does not produce ions in the same way as the "Kaufman-type ion beam source," although arguably it does produce a similar, but much improved and less contaminated result. This source was in existence and known to those skilled in the art at the time the application for the '958 patent was filed, a time long before the discussions that Litton and Baumeister had with the examiner following the filing of Paper No. 15.

Although prosecution history estoppel may not altogether preclude Litton from claiming infringement by processes using ion beam sources other than the one described in the specification, the doctrine of equivalents cannot be extended so far as to place Honeywell's RF ion beam process within the reach of the '849 reissue. The '849 reissue is not a pioneer patent and it cannot be broadened in this fashion. Honeywell did not infringe the '849 reissue by the use of its RF ion beam process.

D. Intervening Rights

On October 7, 1991, the Court granted Honeywell's Motion for Partial Summary Judgment for an Order Finding that U.S. Patent 32,849 and U.S. Patent 4,142,958 Are Not Identical Pursuant to 35 U.S.C. § 252. On November 7, 1991, the Court reconsidered and vacated its grant of Honeywell's Motion for Partial Summary Judgment because it determined that there were triable issues of fact regarding whether the '958 patent and the '849 reissue were identical within the meaning of 35 U.S.C. § 252. After hearing all of the evidence, the Court determined that no reasonable jury could find that '958 patent and the '849 reissue are identical within the meaning of 35 U.S.C. § 252 and granted part six of Honeywell's Motion for Judgment as a Matter of Law. Accordingly, the Findings of Fact and Conclusions of Law filed on October 7, 1991 in conjunction with the Court's original order granting Honeywell's Motion for

Partial Summary Judgment and for an Order Finding that U.S. Patent 34,849 and U.S. Patent 4,142,958 are Not Identical Pursuant to 35 U.S.C. § 252 are adopted by the Court and reinstated.

E. Supplemental State Law Claims

1. Intentional Interference with Contractual Relations

Litton claims that at the time Honeywell began buying mirrors from Louderback and his company, Ojai Research (collectively "Louderback"), it tortiously induced Louderback to violate his licensing agreement with Litton. The jury found for Litton on this claim and assessed the damages at $1.2 billion. Honeywell now argues that the jury's verdict cannot be supported as a matter of law. The Court is in agreement with Honeywell.[46]

The elements of intentional interference with contractual relations are "(1) a valid contract between the plaintiff and a third party; (2) the defendant's knowledge of this contract; (3) the defendant's intentional acts designed to induce a breach or disruption of the contractual relationship; and (5) resulting damage." *Pacific Gas & Elec. v. Bear Stearns & Co.*, 50 Cal. 3d 1118, 1126, 270 Cal. Rptr. 1, 3-4 (1990).

To establish that Honeywell induced Louderback to breach his contract with Litton, Litton must show either that Louderback actually breached the contract or that his contractual relationship with Litton was disrupted by Honeywell in a way that made Litton's performance of the contract more costly or burdensome. *Pacific Gas & Elec.*, 270 Cal. Rptr. at 6-7. The April 1981 contract at issue here licenses Louderback to use the '958 patent process and to sell products manufactured by the process (Ex-

[46] The Court finds no evidence in the record which would warrant discussion of any liability of General Optic's for either of the state law torts.

hibit 1079 at 6, § 2.1). As part of the agreement Louderback agreed not to sell any products manufactured by the process for end use in a laser inertial instrument to anyone other than Litton. By its terms, the contract licensed Louderback to use both the '958 patent process and Litton's "proprietary information."

Litton could not, of course, restrain Louderback from using technology in the public domain. The Ninth Circuit has recognized that the theory of inducing breach of contract may not be used to assert an invalid patent. It has stated:

> If a patent holder can exact from another a promise not to infringe, and thereby recover from one inducing the breach of that promise, in the absence of a valid patent, the patent holder is afforded more protection than the patent laws allow. The patent holder acquires this additional protection 'merely because he . . . chose one remedy (inducement to breach a contract not to infringe) rather than another (inducement to infringe) on the same substantive issue.' Federal policy favoring free competition in ideas not meriting protection cannot be so easily subverted.

Massillon-Cleveland-Akron Sign Co. v. Golden State Advertising Co., 444 F.2d 425, 428 (9th Cir. 1971), *cert. denied*, 404 U.S. 873 (1971), *quoting, Katzinger Co. v. Chicago Metallic Mfg. Co.*, 329 U.S. 394 (1947). Thus, to the extent that the licensing agreement purported to restrict Louderback's use of the process claimed by the '958 patent, Litton may not use the agreement as an alternate route to enforcing that patent against Honeywell. The Court notes that this would be the case even if the '849 reissue were valid because, as the Court has previously ruled under the doctrine of intervening rights, Honeywell's activity prior to the granting of the '849 reissue cannot give rise to infringement liability.

The Ninth Circuit's decision in *Massilon-Cleveland* cannot, however, completely shield Honeywell from liability for inducing Louderback to breach the contract. The contract, by its terms, could be breached by Louderback not only if he sold products made by the patented process to Honeywell to be used for a purpose proscribed by the agreement, but also if Louderback used Litton's trade secrets in manufacturing such products for such a purpose. The Supreme Court has made clear that patent law does not preempt or invalidate trade secret law and that contracts to license or protect trade secrets are not in conflict with the objectives of the patent law. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974). Thus, to the extent Honeywell induced Louderback to use Litton's trade secrets in the manufacture of mirrors sold by Louderback to Honeywell, Honeywell could be liable to Litton.

Nonetheless, Litton cannot prevail on its claim of interference with contractual relations on the theory that trade secrets were improperly used because there is a total absence of proof that Louderback ever actually used any Litton trade secret in manufacturing a mirror for Honeywell. Likewise, the record contains no evidence that Louderback ever revealed any trade secret to Honeywell. Thus, the record does not show that Louderback ever actually *breached* the contract by using or revealing Litton's trade secrets.

It is uncontroverted that Louderback used a process *different* from Litton's process when he made the mirrors for Honeywell. Much of the case turned on whether that process, though different, nonetheless infringed Litton's '849 reissue. However, the record contains *no evidence whatsoever* that Louderback's new process made use of Litton's trade secrets. In fact, the record does not even reveal what Litton contends its trade secrets were.

Litton had the burden of proving that Louderback used one or more of its trade secrets in breach of the agreement. *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1243 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 853 (1989). Litton did not meet the burden of proving that it had any trade secrets, and, if so, what they were. Moreover, if it had trade secrets, Litton made no attempt to prove which ones were actually used, what they were used for or when they were used. Litton argues, however, that because Louderback entered into the agreement in the first instance, his later and admittedly different process *must have* made use of Litton's trade secrets. In effect, Litton argues that a showing of the existence of a valid contract, together with sales by Louderback to Honeywell, relieves it of the burden to show that Louderback did in fact breach the contract.

The mere existence of an agreement not to use plaintiff's trade secrets does not relieve plaintiff of the burden to prove that the defendant accused of appropriating the trade secrets did in fact make use of them, *and* that the use was prohibited by the agreement. Were Litton suing Honeywell directly for trade secret appropriation, it would have to prove that it had secrets and that Honeywell used them in violation of Litton's rights. Likewise, if Litton were suing Louderback for breach of the agreement on a trade secret theory, it would have to show that Louderback breached the agreement by using or revealing a trade secret belonging to Litton. A contract to restrict the use of trade secrets cannot itself establish that trade secrets actually existed or that they were infringed. *Scott v. Snelling & Snelling, Inc.*, 732 F. Supp. 1034, 1043 (N.D. Cal. 1990) ("Snelling's argument in reliance on contractual language begs the question: before the Court can enforce the covenant restraining competition in the franchise agreements on the basis of the use of trade secrets, it must determine for itself whether the informa-

tion actually used constitutes a trade secret subject to judicial protection at all.").

Litton argues that because it brought an indirect claim against Honeywell, instead of a direct claim against Louderback, it need not show that the contract was breached. While a showing that the contract was actually breached is not necessary to prevail in every case of interference with contractual relations, in the absence of such a showing the plaintiff must show that the interference made the plaintiff's performance more costly or burdensome. *Pacific Gas & Electric,* 270 Cal. Rptr. at 6-7. Litton has failed to make that showing. Because the '958 patent was invalid, the '849 reissuance is subject to serious challenge, and Litton has not shown the appropriation of any trade secret, Louderback may have done nothing he was not otherwise entitled to do. He had every right to sell products made by a process in the public domain to anybody he wished.

The record does not establish appropriation, and therefore it also does not establish breach. If Louderback did not breach the contract, it is impossible to discern how Litton was damaged. Litton does not argue that Honeywell caused Louderback to cease selling mirrors to Litton or that Honeywell ever induced Louderback to take any action which would disrupt Louderback's relationship with Litton. In the absence of proof of a trade secret violation, the only damage that Litton can point to is the cost of bringing this litigation. The cost of litigation brought to assert the plaintiff's contractual rights, however, is not the type of damage that can be recovered on the theory of an intentional interference with contract. *Pacific Gas & Electric,* 270 Cal. Rptr. at 12.

Notably, even the broader tort of interference with prospective economic advantage requires that the relationship between the prospectively contracting parties actually be disrupted. *Pacific Gas & Electric,* 270 Cal. Rptr.

at 6, n.8. How Litton's relationship with Louderback was disrupted by Honeywell's action was never established on this record. The jury indicated its ultimate conclusion on the verdict form when it wrote the words "Honeywell *did* use wrongful means" on it. However, those words cannot, in and of themselves, substitute for proof of the elements of the tort.

Were the Court to accept Litton's intentional interference with contract argument, the result would be to expand the scope of protection for trade secrets beyond the permissible boundaries now set by existing law. Indeed, the acceptance of Litton's argument would undermine California's statutory policy against contracts in restraint of trade. California Business & Professions Code section 16600 provides that, with certain exceptions, every contract by which anyone is restrained from engaging in a lawful profession, trade, or business is void. Cal. Bus. & Prof. Code § 16600. Although section 16600 does not invalidate contracts for the protection of trade secrets, it does render such contracts unenforceable absent proof that the trade secret was actually used. *Rigging Int'l Maintenance Co. v. Gwin,* 128 Cal. App. 3d 594, 614, 180 Cal. Rptr. 451, 463 (1982). Were the Court to allow the enforcement of a restraint on trade without proof that a trade secret was actually used, the Court would, in effect, violate the proscription of section 16600. Honeywell's motion for JMOL is granted as to this claim.

2. Intentional Interference with Prospective Economic Advantage

Litton contends that Honeywell intentionally interfered with Litton's relationship with Boeing, McDonnell Douglas and Airbus.[47]

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[47] In its Third Amended Complaint, Litton did not allege interference with the those contracts, but rather that Honeywell, through its German subsidiary, Sondertechnik, intentionally interfered with a business relationship between Litton and the Ger-

> [T]he elements of intentional interference with prospective economic advantage are (1) an economic relationship between the plaintiff and some third person containing the probability of future economic benefit to the plaintiff; (2) knowledge by the defendant of the existence of the relationship; (3) intentional acts on the part of the defendant designed to disrupt the relationship; (4) actual disruption of the relationship; and (5) damages proximately caused by the acts of defendant.

Asia Inv. Co. v. Borowski, 133 Cal. App. 3d 832, 840-41, 184 Cal. Rptr. 317, 323 (1982).

For the purpose of this analysis, the Court will assume that the jury could have concluded that all of these elements were shown. That all of the elements of the tort were shown does not end the inquiry, however, because Honeywell cannot be liable for interference with Litton's prospective economic advantage if it has established the affirmative defense of the privilege of free competition. The California Supreme Court has said:

> Perhaps the most significant privilege or justification for interference with a prospective business advantage is free competition. Ours is a competitive economy in which business entities vie for economic advantage. In a sense, all vendees are potential buyers of the products and services of all sellers in a given

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man Air Force. Likewise, the pretrial conference order makes no reference to the domestic customer interference argument made by Litton. No evidence regarding either Sondertechnik or the German Air Force was ever introduced and Honeywell now argues that Litton's claim for prospective interference with economic advantage should be dismissed for failure of proof. However, Honeywell agreed to jury instructions which asked the jury to decide whether Honeywell had interfered with Litton's relationship between Boeing, McDonnell Douglas and Airbus and thus agreed that the claim was in the case. Therefore, the Court will assess the jury's conclusion on the merits.

> line, and success goes to him who is able to induce potential customers not to deal with a competitor. Thus, as Prosser states: 'So long as the plaintiff's contractual relations are merely contemplated or potential, it is considered to be in the interest of the public that any competitor should be free to divert them to himself by all fair and reasonable means (Prosser, Torts (4th ed. 1971) p. 954).

Buckaloo v. Johnson, 14 Cal.3d 815, 828, 122 Cal. Rptr. 745, 752 (1975).

A competitor does not interfere with his competitor's prospective advantage if (1) the relation concerns a matter involved in the competition between the actor and the other; (2) the actor does not employ wrongful means and his action does not create or continue an unlawful restraint of trade; and (3) his purpose is at least in part to advance his interest in competing with the other. *A-Mark Coin Co. v. General Mills, Inc.*, 148 Cal. App. 3d 312, 323, 195 Cal. Rptr. 859, 867 (1983).

> Thus, in the absence of prohibition by statute, illegitimate means, or some other unlawful element, a defendant seeking to increase his own business may cut rates or prices, allow discounts or rebates, enter into secret negotiations behind the plaintiff's back, refuse to deal with him or threaten to discharge employees who do, or even refuse to deal with third parties unless they cease dealing with the plaintiff, all without incurring liability.

Id.

It is undisputed that Litton and Honeywell were competitors for the business of Boeing, McDonnell Douglas and Airbus, and that Honeywell's purpose in all of its actions was to advance its own economic interest in that competition. Therefore, the only question is whether Honeywell used wrongful means in obtaining the contracts with Boeing, Airbus, and McDonnell Douglas. As

stated, the jury found that Honeywell did use wrongful means in that it willfully infringed Litton's patent. Since the Court has now concluded that the '849 reissue is both invalid and unenforceable, and there is no evidence in the record that Honeywell engaged in any other unfair or illegal business practice to gain the business of these aerospace manufacturers, Honeywell cannot be liable on this theory.

Litton argues that the evidence supports a finding that Honeywell's motives were bad. Illicit motives alone, however, cannot establish the tort unless the defendant *actually commits* an unfair or illegal act. *Id.* Although there is evidence in the record indicating that certain personnel at Honeywell may have thought that Honeywell was using means which would subject it to a lawsuit, that evidence does not prove that Honeywell *actually used* means which were wrongful. Without such evidence, Litton cannot prevail.

Litton also argues that Honeywell committed antitrust violations that establish the wrongful means necessary to defeat Honeywell's competitive privilege. However, the jury was not instructed on antitrust law and the parties did not try any antitrust issues. Litton may not now attempt to rely on an antitrust claim that was not tried as a means of challenging Honeywell's justification defense to the tort. The Court finds that, on the record established at trial, Honeywell's actions with regard to sales to Boeing, Airbus, and McDonnell Douglas are privileged as a matter of law. Accordingly, Honeywell's Motion for JMOL is granted with respect to Litton's claim for intentional interference with prospective economic advantage.

III.

HONEYWELL'S MOTION FOR A NEW TRIAL

Rule 50 of the Federal Rules of Civil Procedure requires that when a district court grants a JMOL motion, "the court shall also rule on the motion for a new trial, if any, by determining if it should be granted if the judgment is thereafter vacated or reversed, and shall specify the grounds for granting or denying the motion for the new trial." Fed. R. Civ. P. 50(c). Since Honeywell made a motion for a new trial, the Court is required to rule conditionally on it.

To grant Honeywell's motion for a new trial, the Court must find that the jury's verdict is contrary to the clear weight of the evidence, or is based on evidence which is false, or that to grant the motion is necessary to prevent a miscarriage of justice. *Richardson v. Suzuki Motor Co., Ltd.*, 868 F.2d 1226, 1245 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 853 (1989). That the court would simply have reached a different verdict is not a sufficient ground for granting a new trial motion. *Id.* Likewise, doubts about the correctness of the jury's verdict are not sufficient grounds for a new trial, but rather the trial court must have a firm conviction that the jury has made a mistake. *Landes Constr. Co., Inc. v. Royal Bank of Canada*, 833 F.2d 1365, 1372 (9th Cir. 1987). However, in assessing a new trial motion, the Court may weigh the evidence and the credibility of witnesses and may grant the motion even if the verdict is supported by substantial evidence if to do so would prevent a miscarriage of justice. *Roy v. Volkswagen of America, Inc.*, 896 F.2d 1174, 1176 (9th Cir. 1990), *cert. denied*, 500 U.S. 928 (1991). Moreover, in assessing a new trial motion, the Court need not view the evidence in a light most favorable to the non-moving party. *Landes Constr.*, 833 F.2d at 1371. A new trial may also be granted when in its judgment, the trial court finds that the amount of compensation awarded is exces-

sive. *Hanson v. Shell Oil Co.*, 541 F.2d 1352, 1359 (9th Cir. 1976), *cert. denied*, 429 U.S. 1074 (1977).

The Ninth Circuit has pointed out that while the court's power to grant a new trial, even though substantial evidence exists to support the verdict, is clear, the discretion it should use in exercising that power is not. *Landes Constr.*, 833 F.2d at 1371. The Ninth Circuit offers the following advice:

> It may be doubted whether there is any verbal formula that will be of much use to trial courts in passing on motions [for a new trial on grounds that the verdict is against the clear weight of the evidence]. Necessarily all such formulations are couched in broad and general terms that furnish no unerring litmus for a particular case. On the one hand, the trial judge does not sit to approve miscarriages of justice. His power to set aside the verdict is supported by clear precedent at common law and, far from being a denigration or usurpation of jury trial, has long been regarded as an integral part of trial by jury as we know it. On the other hand, a decent respect for the collective wisdom of the jury, and for the function entrusted to it in our system, certainly suggests that in most cases the judge should accept the findings of the jury, regardless of his own doubts in the matter. Probably all that the judge can do is balance these conflicting principles in light of the facts of the particular case. If, having given full respect to the jury's findings, the judge on the entire evidence is left with the definite and firm conviction that a mistake has been committed, it is to be expected that he will grant a new trial.

Landes Constr., 833 F.2d at 1371-72, *quoting*, 11 C. Wright & A. Miller, *Federal Practice and Procedure* § 2806 at 48-49 (1973).

Honeywell asserts that a new trial is necessary because the jury's damages award was excessive and contrary to

the clear weight of the evidence. Litton's damages theory was based on a lost profits model. Upon a finding of infringement of a valid patent, the patent laws require that a court shall award damages adequate to compensate the patentee for infringement, but in no event less than a reasonable royalty. 35 U.S.C. § 284.

In determining patent damages, the profits lost by the patent owner in a two-supplier market is a proper ground for granting relief. *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d 1056, 1065 (Fed. Cir. 1983). However, to be entitled to damages beyond a reasonable or established royalty, a claimant must prove his actual damages, that is, his entitlement to lost profits. *Water Technologies Corp. v. Calco, Ltd.*, 850 F.2d 660, 671 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 968 (1988). The patent owner must establish a factual basis for causation—that but for the infringer's improper acts, he would have made greater sales, charged higher prices, or incurred lower expenses. *Id.* While damages are to be proved, not presumed, a patent owner need not demonstrate causation with certainty but need only demonstrate a reasonable probability that it would have made some or all of the sales. *Id.*

To recover, as an element of patent damages, the profits that the patent owner would have made absent infringement, the patent owner must prove (1) demand for the patented product; (2) absence of noninfringing substitutes; (3) its manufacturing and marketing ability to exploit the demand; and (4) the amount of profit it would have made. *Kaufman Co., Inc. v. Lantech, Inc.*, 926 F.2d 1136, 1140-41 (Fed. Cir. 1991); *Panduit Corp. v. Stahlin Bros. Fibre Works*, 575 F.2d 1152, 1156 (6th Cir. 1978). Part two of the *Panduit* test embodies the idea that lost profits for all sales made by an infringer are easier to obtain where there are only two suppliers in the market, the infringer and the patent owner. *Water Technologies*, 850 F.2d at 672.

In light of Federal Circuit precedent, the Court finds that Honeywell's motion for a new trial must be granted based on the jury's damages award because the weight of the evidence establishes that Litton has failed to meet its burden on any of the four *Panduit* factors. The clear weight of the evidence shows that non-infringing substitutes were available throughout the relevant period and that Litton could not have supported the demands of the entire market. Likewise, the amount of the damages is not supported by the weight of the evidence.

Litton's damages case is based on a study by Litton's economic expert Almarin Phillips ("Phillips"), together with the same five or six documents that Litton used to persuade the jury of its infringement claim, its nonobviousness claim, and its state law claims.[48] The documents

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[48] Those documents are (1) a service letter sent out by Boeing recording three instances in which Honeywell inertial reference units failed while in use on Boeing aircraft (Exhibit 98); (2) an FAA airworthiness directive that restricted the use of certain Boeing 737-300 aircraft equipped with Honeywell inertial reference units (Exhibit 1084); (3) a Honeywell letter to Boeing that states that Honeywell had a mirror problem in 1984, which it had corrected by 1989 by means of a "high-level mirror life improvement program" (Exhibit 96); (4) a Honeywell document that describes Honeywell's early mirror pull program (Exhibit 101); (5) an awards nomination letter in which a Honeywell scientist stated that Louderback and Litton were responsible for the development of ion beam mirrors (Exhibit 33); and (6) excerpts from the diary of Honeywell engineer Richard Rostal that show that Honeywell was aware that Litton might sue at the time it was negotiating to buy mirrors from Louderback, (Exhibit 43 at 3608430). The Boeing service letter, which was issued in 1989, after Honeywell's adoption of ion beam mirrors, describes a problem with *detection of failures* rather than failures themselves, and seems unrelated to mirror performance. The FAA airworthiness directive is likewise directed to problems that were not mirror related. Neither document discusses more than a few failures and therefore neither is particularly probative of the overall reliability of Honeywell's system. The Honeywell letter to Boeing supports the uncontroverted fact that ion beam mirrors increase reliability, but does not refute the evidence that even with electron beam mirrors, Honeywell's

are only marginally relevant to the question of whether Litton is entitled to lost profits, while the study is pure fantasy.

Phillips' study assumes that had Honeywell not begun using ion-beam deposited mirrors, (1) Boeing would not have granted Honeywell the November 14, 1985 contract that made Honeywell's inertial navigation systems standard on Boeing aircraft but would instead have given the contract to Litton; (2) Litton would have been able to ramp up to meet the demand of the Boeing contract; (3) the increased volume achieved by Litton would have allowed Litton to overcome the substantial reliability problems of its own systems; and (4) because of the increased reliability achieved by the volume of production facilitated by the Boeing contract, Litton would have forced Honeywell out of the inertial navigation market. The sum of those assumptions is what Phillips refers to as the "but for" world.

The fundamental assumption underlying Litton's damage study is that an inertial navigation system that employed electron-beam mirrors in its ring laser gyroscopes would have been, at the time Honeywell was granted the 1985 Boeing contract, unacceptably unreliable. The evidence presented at trial belies that assumption. It is virtually uncontroverted that prior to Honeywell's use of ion beam deposited mirrors, Honeywell's system substantially

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inertial guidance system was more reliable than Litton's. The evidence relating to Honeywell's early pull program does call Honeywell's reliability data into some question, but Honeywell has shown that even taking the early pull program into account, its electron beam reliability was higher than Litton's ion beam reliability. The awards letter is simply not probative of the patentability of the Wei/Louderback process. It is nothing more than unauthenticated opinion testimony and must be disregarded to the extent that Litton used it for that purpose. The excerpts from the Rostal diaries, although probative of willfulness, are not probative of patentability, obviousness, or damages.

outperformed Litton's ion beam system.[49] Both Phillips and Litton's damages witnesses admitted that in the mid-1980s, Honeywell's performance exceeded Litton's. For example, Phillips said:

> Sir, I am not contesting that in the 1982, '83, '84, '85, '86, '87, period that the measured performance of Honeywell's gyros was above the measured performance of Litton's gyros through those years. That is no contest. It was. . . . In the actual world I concede that [Honeywell's electron beam performance was better than Litton's ion beam performance through 1987].

(Transcript at 8061: 8-16). Likewise, Marshall Mahler, the president of Litton's Aero Product's Division, testified that in 1985, Honeywell's reliability was better than Litton's. (Transcript at 3560: 18-25). Moreover, the Litton documents that compare the performance of the Litton and Honeywell systems uniformly show that Honeywell's system outperformed Litton's.

Litton's position was that its reliability would have improved when it achieved the Boeing contract because it would have been able to increase production significantly.

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[49] Litton has made the argument that because Honeywell had an early removal system, its reliability data was not accurate. Both Litton and Honeywell measure reliability in terms of "mean time between failure" ("MTBF") and "mean time between removal" ("MTBR"). MTBF measures the amount of time, in flight hours, the system is on the aircraft before it fails. MTBR measures the amount of time the system is on the aircraft before it is removed for service. Because some removals do not reveal that the device has failed, the MTBR figure is always lower than the MTBF figure. Litton showed that there were some early removals by Honeywell. Then Litton argued that Honeywell's early replacement program unfairly raised its MTBF figure by removing still viable gyroscopes prior to failure, thereby creating a situation in which the numbers show that Honeywell's gyroscope never failed. This *argument*, which is all it amounted to because it was never made more specific, is insufficient to counter the actual evidence in the case.

That argument fails because each proposition relies upon proof of the other. Litton cannot show that it would have obtained the 1985 Boeing contract without showing that its reliability was better than Honeywell's. Likewise Litton cannot show that its reliability would have been better than Honeywell's, without showing that it would have achieved the 1985 Boeing contract.

Litton acknowledges that its own internal documents described Honeywell's performance up until 1984 as "spectacular," but argued that Honeywell's mirror problem would, absent infringement, have caused a dramatic crash in reliability by the end of 1985. The argument proceeds that Boeing would then, of necessity, have granted the 1985 contract to Litton, not Honeywell. Whatever the Honeywell internal documents say about its reliability problems, these documents do not compare Honeywell's performance with that of Litton, nor do they contain actual reliability data sufficient to warrant the conclusion urged by Litton.

Because the record shows that the Litton system employing ion beam mirrors was not as reliable as the Honeywell system employing electron beam mirrors, the assumption that Litton would have been granted the 1985 Boeing contract is mere speculation. Boeing was not buying mirrors, but was rather buying a complete inertial navigation system. Both the inertial navigation system produced by Litton and that produced by Honeywell were highly complex and contained many elements other than mirrors, which could affect the system's reliability.[50] Although Boeing was concerned about reliability, that concern was about the reliability of the system as a whole,

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[50] For example, in 1986 Litton faced a laser intensity degradation problem that it has called the "DCI problem," which Litton witnesses have testified was not a mirror problem.

not simply mirror reliability. Honeywell would have won the 1985 contract even without ion beam mirrors.[61]

That Honeywell's electron beam systems were chosen over Litton's prior to Honeywell's adoption of ion beam mirrors supports that conclusion. Honeywell won the contract to supply the inertial navigation system for the Boeing 767 and 757 in 1978 in competition against Litton's bid based on a mechanical gyroscope system. Then, in 1982, Boeing chose Honeywell's system employing electron beam mirrors over Litton's system for the 737-300. Litton chose not to bid on the Boeing 777 contract. Likewise Honeywell's systems employing electron beam mirrors prevailed over Litton's systems employing ion beam mirrors for the Airbus A-320, the Gulf Stream GIV and the Canadair Challenger. The evidence is overwhelming that, although ion beam mirrors do appear to provide a reliability advantage, Honeywell's systems were more reliable overall than Litton's systems.

Another fundamental flaw in Litton's damages study is that it is based on the assumption that Honeywell could not use ion beam sources to manufacture mirrors in 1985. Rather, because the '958 patent was invalid and the claims of the '849 reissue are materially different than those of the '958 patent, the Court has previously ruled that under the doctrine of intervening rights, Honeywell was free to use the claimed process until the date of reissue in 1989. Honeywell's freedom to use the patented process until 1989 renders completely groundless the assumption that Litton would necessarily have been awarded the 1985 Boeing contract.

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[61] Moreover, Litton has not shown that, absent infringement, Litton could have taken Honeywell's business with McDonnell Douglas. The uncontroverted testimony in the record is that McDonnell Douglas bought Honeywell's system because, following Honeywell's purchase of Sperry, Honeywell could offer an entire integrated cockpit. Litton did not offer an integrated cockpit.

Even if the Court were to overlook the other flaws in Litton's damages analysis, Litton's analysis cannot pass the *Panduit* test. The first *Panduit* factor is demand for the patented product. As to this factor, there is a total absence of evidence that any airframe manufacturer ever had any desire to purchase an inertial navigation system that used ring laser gyroscopes *equipped with ion beam mirrors*. There is, however, substantial evidence of demand for a more reliable inertial navigation system. Witnesses from Boeing testified that they would choose a more reliable system over a less expensive system, but, again, the reliability of the mirrors is but one element in the reliability of the system. The overwhelming weight of the evidence is that Honeywell had the more reliable of the two systems.

Likewise, Litton has failed to show the absence of nonfringing alternatives. The success of Honeywell's system using electron beam mirrors over Litton's system using ion beam mirrors proves that it is a non-infringing alternative. Litton, however, argues that Honeywell's adoption of ion beam mirrors shows conclusively that electron beam mirrors were not a non-infringing alternative. However, that Honeywell chose to use ion beam mirrors does not prove that electron beam mirrors are not an alternative because, as stated, mirrors are not the product that was sold but rather are merely a component of the system which was the product. A patentee can recover damages based on the value of an entire apparatus containing several features where the patent-related feature is the basis for customer demand. *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 1022 (1990). Here, however, there is virtually no evidence that the patent-related feature was the basis of customer demand.

Most telling, however, is that the substantial weight of the evidence supports the conclusion that Litton would

have been unable to meet the market demand even if it had achieved the market domination it forecasts in its damage study. Throughout the 1980s Litton could not keep up with demand even for its limited portion of the market. In the mid to late 1980s, Litton was forced to abandon its efforts to compete in the corporate jet market because it could not produce enough systems to satisfy that market and maintain its commitment to Airbus. Litton was even unable to produce enough gyroscopes in 1977 to perform a planned retrofit designed to remedy Litton's "DCI problem." Moreover, a Litton internal document reveals that in fiscal year 1987 Litton lost $3,854,000 in sales because of a shortage of gyroscopes and projected that it would lose an additional $14,333,000 in fiscal 1988 because of continued shortage. (Exhibit 6512). Likewise, in May of 1986 Litton was unable to keep up with the demand for gyroscopes to replace field failures. The shortage continued through at least August of 1986. (Exhibit 6410).

The Court cannot accept the proposition that while Litton could not keep up its production to the extent necessary to maintain its limited share of the market, Litton could have "ramped up" production to ten times that level if Honeywell had not infringed. The involved argument that Litton would have solved its production problems by maintaining responsibility for the systems in its Guidance and Control Division in Woodland Hills, California, rather than giving production responsibility to its Aero Products Division in Canada as it actually did again invites the trier of fact to engage in a combination of hindsight and speculation.[52] Whether Litton would have or could have changed the whole organization of the company if Honeywell had not used mirrors manufactured from ion beam

[52] Litton's Guidance and Control Division is largely responsible for Litton's military navigation products while the Aero Products Division is responsible for Litton's commercial navigation products. According to Litton, the engineers with the ability to solve technical problems were at the Guidance and Control Division.

sources is merely a matter of conjecture. Moreover, even if Litton had made such a change, one can only speculate as to the effect that change would have had on Litton's other production problems.

There is no evidentiary support for either the $1.9 billion that Litton requested or the $1.2 billion that the jury awarded. Although the substantial weight of the evidence might support a damages figure closer to one of those suggested by Honeywell's experts, a remittitur will not cure what happened here. Because it would be a substantial miscarriage of justice to allow the jury's $1.2 billion award to stand, Honeywell's motion for a new trial is granted on the issue of damages.

Honeywell also moves for a new trial on the ground that the Court improperly admitted certain exhibits, and on the further ground that Litton's counsel engaged in misconduct that was prejudicial to Honeywell. Honeywell's motion for a new trial is denied on those grounds.

IV.

CONCLUSION

The Court finds that the '849 reissue is unenforceable on the ground that it was procured by inequitable conduct. Additionally, although the Court believes that jury verdicts should be upheld if consistent with a reasonable interpretation of the evidence, Honeywell's renewed motion for JMOL is granted because, viewing the evidence in the light most favorable to Litton, and drawing all inferences from the evidence in that light as well, the '849 reissue is invalid as obvious under 35 U.S.C. § 103. Likewise, Honeywell's renewed motion for JMOL is granted with respect to Litton's state law claims for interference with contract and interference with prospective economic advantage. All of the other grounds urged by Honeywell in its motion for a JMOL are denied. In the alternative, the Court grants Honeywell's motion for a new trial on

the issue of damages on the ground that the jury's award is inconsistent with the clear weight of the evidence, and to permit it to stand [53] would constitute a miscarriage of justice.

DATED: January 4, 1995

/s/ Mariana R. Pfaelzer
MARIANA R. PFAELZER
United States District Judge

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[53] The Court notes Litton's frequent references in its papers to colloquy between the Court and Mr. Lorig in which the Court indicated that it might be inclined to permit a jury verdict to stand. There is bound to be extended colloquy between the court and counsel in a long and complex trial. However, colloquy cannot create an estoppel to hear further argument.

APPENDIX C

[Filed Oct. 7, 1991]

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

Case No. CV 90-93 MRP
CV 90-4823 MRP

LITTON SYSTEMS, INC.,
a Delaware corporation,
Plaintiff,

v.

HONEYWELL, INC.,
a Delaware corporation,
Defendant.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

FINDINGS OF FACT

1. Claim 2 of U.S. Patent 4,142,958 ("the '958 Patent") refers to "bombarding targets obliquely with an ion beam in a vacuum chamber. . . ."

2. The '958 Patent claims described a process using any ion beam source.

3. U.S. Patent Re. 32,849 ("the '849 Re. Patent") describes a step of "bombarding targets obliquely with an ion beam *produced or derived from a Kaufman-type ion beam source.*" (Emphasis in original.)

4. Claim 1 of the '849 Re. Patent pertains only to a Kaufman-type ion beam source.

5. Litton sought reissue of its '958 Patent because Litton had "claimed more than [it] had a right to claim" in the '958 Patent.

6. Litton's originally submitted reissue claims cover an ion beam generated by any of the numerous ion beam sources known at the time.

7. The United States Patent and Trademark Office ("PTO") rejected Claim 1 of the '849 Re. Patent so long as Claim 1 lacked the Kaufman-source limitation.

8. The PTO specifically made overcoming its rejection of Litton's reissue application dependent upon the addition of the limitation "produced by or derived from a Kaufman-type ion beam source."

9. The PTO required the Kaufman-type ion beam source limitation because the PTO found that without the limitation, Litton was not "claiming what they regarded as their invention."

10. Litton's reissue proceedings narrowed the scope of the '958 Patent.

11. To the extent any Conclusions of Law are deemed to be Findings of Fact, they are hereby incorporated into these Findings of Fact.

CONCLUSIONS OF LAW

1. If a patent's claims are inoperative or invalid, a patentee may surrender the patent and replace it with a reissue patent correcting the defect. Federico, *Intervening Rights in Patent Reissues,* 30 Geo. Wash. L. Rev. 603 (1962).

2. 35 U.S.C. § 252 ("§ 252") protects third persons who rely on the scope of a claim as originally granted, as against subsequent changes in scope by reissue. 35 U.S.C.

§ 252, *Slimfold Manufacturing Co. Inc. v. Kinread Industries*, 810 F.2d 1113, 1117 (Fed. Cir. 1987).

3. A patentee may recover damages for infringement occurring before reissue only if an "identical" claim is carried through from the original patent to the reissue patent. Section 252.

4. "Identical," within the meaning of § 252, means "without substantive change." *Seattle Box Co. v. Industrial, Crating & Packaging*, 731 F.2d 818, 822, 828 (Fed. Cir. 1984).

5. The second paragraph of 35 U.S.C. § 252 requires that a substantive change be made to the claims in reissue before an infringer can assert an intervening right. *Kaufman Co. v. Lantech, Inc.*, 807 F.2d 970, 978 (Fed. Cir. 1986).

6. Changes which broaden, narrow or alter the scope of an original patent's claim are substantive changes. *Kaufman Company, Inc. v. Lantech, Inc.*, 807 F.2d 970, 977 (Fed. Cir. 1986).

7. The addition of the words *"produced by or derived from a Kaufman-type beam source"* narrows the scope of Claim 1 of the Reissue Patent. *Id.; Seattle Box.*

8. Claim 1 of U.S. Patent Re. 32,849 ("the '849 Re. Patent) Patent is not identical to Claim 2 of U.S. Patent 4,142,958 ("the '958 Patent), within the meaning of 35 U.S.C. § 252. *Seattle Box; Kaufman;* 35 U.S.C. § 252.

9. Because the '849 Patent differs substantively from the '958 Patent, Litton may not recover damages for infringement of the '849 Re. Patent which occurred before the reissue date. 35 U.S.C. § 252.

10. The substantive changes between Claim 1 of the '849 Re. Patent and Claim 2 of the '958 Patent extend to dependent Claims 3-9 of the '849 Re. Patent and depend-

ent Claims 3-9 of the '958 Patent, rendering Claims 3 through 9 of the '958 and '849 Patents, respectively, substantively different from each other. 35 U.S.C. § 252.

11. Claim 1 of the '849 Re. Patent and claims dependent thereon and Claim 2 of the '958 Patent and claims dependent thereon are not "identical" within the meaning of § 252. 35 U.S.C. § 252.

12. To avoid summary judgment, Litton must show that a triable issue of fact exists with respect to Honeywell's Motion For Partial Summary Judgment for an Order Finding that the '849 Re. Patent and the '958 Patent Are Not Identical, Within the Meaning of 35 U.S.C. § 252 ("Motion for Partial-Summary Judgment"), such that "reasonable minds could differ over the import of the evidence." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 249-250, 106 S. Ct. 2505, 2511 (1986).

13. Litton cannot raise a triable issue of fact with respect to Honeywell's Motion for Partial Summary Judgment. *Id.*

14. The Conclusions of Law, insofar as they may be considered Findings of Fact, are so found to be true in all respects.

DATED: October 3, 1991

/s/ Mariana R. Pfaelzer
MARIANA R. PFAELZER
United States District Judge

APPENDIX D

[Filed Sep. 11, 1996]

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

95-1242, -1311
(DCT - CV 90-93)

LITTON SYSTEMS

v.

HONEYWELL INC.

ORDER

A combined petition for rehearing and suggestion for rehearing in banc having been filed by the CROSS-APPELLANT, and a response thereto having been invited by the court and filed by the APPELLANT, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the suggestion for rehearing in banc and response having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the suggestion for rehearing in banc be and the same hereby is, DECLINED.

The mandate of the court will issue on September 18, 1996.

FOR THE COURT
FRANCIS X. GINDHART
Clerk

By /s/ Brian P. LeDuc
BRIAN P. LEDUC
Associate Chief Deputy Clerk

Dated: September 11, 1996

Note: Pursuant to Fed. Cir. R. 47.6, this order is not citable as precedent. It is a public record.

APPENDIX E

HONEYWELL INC.
Subsidiaries and Affiliates
(1-99% Ownership)

BRAZIL: Embrasid S. A.
CANADA: Comcept Canada Inc.
CHINA: Sinopec Honeywell (Tianjin) Limited
INDIA: Honeywell India Ltd.
INDIA: Tata Honeywell Limited
ITALY: S.C. Alenia—Honeywell S.p.A.
ITALY: Sinted S.p.A.
JAPAN: NEC-Honeywell Space Systems Ltd. ("NHSS")
JAPAN: Yamatake—Honeywell Co., Ltd.
KOREA: LG-Honeywell Company, Ltd.
KUWAIT: Honeywell Kuwait K.S.C.
MALAYSIA: Berkat Honeywell SDN BHD
NETHERLANDS: Cara C' Air B.V.
NETHERLANDS: Turnkiek Process Control B.V.
NORWAY: Nord Ventilasjon A/S
OMAN: Honeywell & Co., Oman L.L.C.
RUSSIA: Honeywell-STERCH Industrial Controls
SAUDI ARABIA: Honeywell Turki-Arabia Limited
SAUDI ARABIA: Saudi Arabian Tetra Tech Limited
TURKEY: Honeywell Otomasyon ve Kontrol Sistemleri Sanayi ve Ticaret A.S.
UKRAINE: Honeywell Ltd.
USA: Foster/Honeywell Joint Venture
USA: GE/Micro Switch Control Inc., a Joint Venture